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(WIM) final report

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MONTANA DEPARTMENT OF HIGHWAYS

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WEIGH-IN-MOTION FINAL REPORT

Prepared by:

Program Development Division
Planning and Statistics Bureau
Rural Planning Section

Sept., 1988

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16. Abstract This report documents the work undertaken by the Montana Department of Highways between April 1987 and September 1988 in the field evaluation of a portable capacitance mat WIM system and the determination of the magnitude and pattern of scale avoidance by heavy vehicles in the state. The project was made possible through a Department of Transportation RTAP grant.

Field work for this study consisted of collecting both WIM and static weight data on heavy vehicles for a minimum of 48 hours at 10 Interstate and 11 Primary static scale sites across the state.

Based on the study's results, it was generally concluded that truck weight data generated by this WIM system should not be used where a high level of individual truck weight accuracy is required. The study also demonstrated that scale avoidance is statistically significant in some regions of the state.

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PROJECT SUMMARY

Scope

In the late summer of 1986 the Montana Department of Highways began work on a study funded by a Rural Technical Assistance Program grant. The primary objectives of this study were to determine the magnitude and pattern of weigh scale avoidance and to determine feasibility of using weigh-in-motion (WIM) equipment for a statewide truck weight sampling program in Montana. In order to accomplish these tasks, six high-speed portable monitoring units manufactured by the Golden River Corporation were acquired; and data was collected using the portable equipment at 21 Interstate and Primary scale house locations during the summers of 1987 and 1988.

General Findings

The results of the data analysis indicate that the WIM systems used for this project, after being calibrated to a specific site, are capable of estimating static scale weights to within ± 12.3%, 68% of the time (1 standard deviation).

Analysis also indicated that the average per vehicle WIM weights for a set of heavy vehicles is very nearly the same as the average per vehicle static weight, after the equipment is calibrated to a specific site.

Vehicle classification accuracies are reliable for five-axle semis, but less reliable for recreation vehicles and some trucks with multi-trailer units.

Equivalent Single Axle Loads (ESAL's) developed from a large set of static scale weights were compared to ESAL's developed from a large set of WIM weights. This comparison showed that ESAL's will tend to be greater when calculated from WIM data than when calculated from static weight data.

The equipment experienced downtime attributable to heavy rains, problems with the oscillator component and damage to mats from brake-locked tires.

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The analysis for scale avoidance demonstrated that scale avoidance is statistically significant in some regions of the state. Avoidance can be characterized as occurring more commonly on the Interstate and on routes in the western part of the state. Where scale avoidance occurs, it is more commonly the result of avoiding open scale periods than of avoiding scale locations.

Conclusion

Based on the study's results, it's generally concluded that truck weight data generated by this system should not be used where a high level of individual truck weight accuracy is required. However, average weight accuracies demonstrate that the equipment has possible merit for systems level planning applications.

MONTANA DEPARTMENT
OF
HIGHWAYS

Weigh-In-Motion (WIM)

Final Report

Project No. RTAP-0030(001)

Prepared by:

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In Cooperation with the
U.S. Department of Transportation,
Federal Highway Administration

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Overview

This report covers the work undertaken between April '87 and September '88 in the data collection and analysis phases of the MDOH Weigh-In-Motion (WIM) Project No. RTAP 030-(001). The WIM equipment used in this study was manufactured by the Golden River Company and at the time of purchase was the only high speed, portable WIM equipment on the market. The system consists of a capacitance mat associated with two temporary inductance loops and a battery-operated recording device. Six complete systems were acquired in the late summer of 1986.

The MDOH WIM project covers two major areas of inquiry.

1. The evaluation of the WIM equipment for accuracy and reliability in a field situation.

2. The determination of static weigh-scale avoidance patterns.

Sample Sites

Data was collected at the 10 Interstate and 11 Primary static scale sites identified in Table 1 and on Map 1. Of the 24 sites originally identified in the WIM Detailed Work Outline, the following 4 sites were not monitored for the stated reasons:

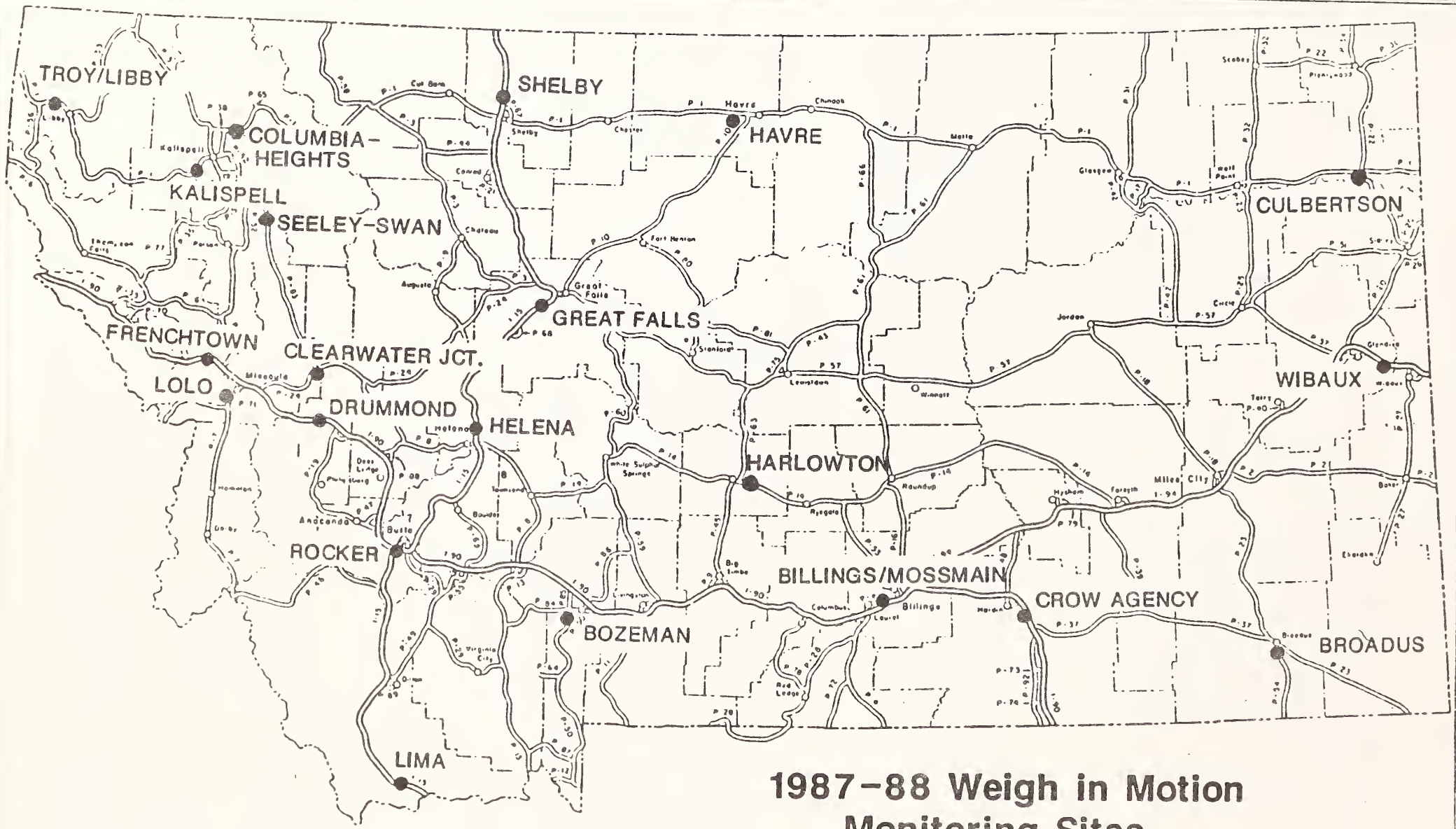
1. Ravalli - Scale currently closed. Data was not required for planning purposes, as the decision to construct a new scale at this location had already been made.

2. Forsyth - Unscheduled, intermittent operation only, usually associated with GVW roving officer operations.

TABLE 1
WEIGH-IN-MOTION
1987-88 MONITORING SITES

	SYSTEM	SITE NAME	ROUTE MILEPOST	DIRECTION OF TRAVEL	COLLECTION DATES
INTERSTATE	I	BILLINGS/MOSSMAIN	I-90, 438.3 I-90, 439.7	EB WB	9/01--9/04/87
	I	BUTTE/ROCKER	I-15, 123.2 I-15, 122.1	EB WB	9/10--9/12/87
	I	DRUMMOND	I-90, 149.6 I-90, 151.8	EB WB	7/07--7/10/87
	I	FRENCHTOWN	I-90, 88.4 I-90, 95.1	EB WB	7/24--7/27/87
	I	GREAT FALLS AIRPORT	I-15, 269.5	NB, SB	10/30--11/02/87
	I	HARDIN (CROW AGENCY)	I-90, 508.9	NB, SB	10/02--10/04/87
	I	HELENA	I-15, 200.5	NB, SB	3/10--3/13/87
	I	LIMA	I-15, 17.2	NB, SB	10/19--10/22/87
	I	SHELBY	I-15, 367.5	NB, SB	8/21--8/24/87
	I	WIBAUX	I-94, 245.5	EB, WB	9/17--9/20/87
OTHER ROADS	P	BOZEMAN	P-50, 83.7 P-50, 80.4 P-84, 27.6 P-85, 1.4	WB NB EB SB	10/27--10/29/87
	P	BROADUS	P-23, 82.8	NB, SB	9/29--10/01/87
	P	CLEARWATER JUNCTION	P-24, 30.4 P-24, 33.0 P-83, 2.4	EB WB SB	7/20--7/22/87
	P P S	COLUMBIA HEIGHTS	P-1, 137.5 P-1, 139.6 S-206, 9.3	EB SB NB	5/11--5/13/88
	P	CULBERTSON	P-1, 642.2 P-1, 645.5 P-22, 86.7	EB WB SB	4/28--4/30/88
	P	HARLOWTON	P-14, 100.5 P-14, 102.5 P-63, 1.9	EB WB SB	6/28--6/30/88
	P	HAVRE	P-1, 377.4 P-1, 379.7 P-10, 110.5	EB WB NB	8/18--8/20/87
	P	KALISPELL	P-1, 115.0	EB, WB	6/26--6/29/87
	P	LOLO	P-7, 85.3	NB, SB	7/11--7/13/87
	P	SEELEY-SWAN	P-83, 81.9	NB, SB	5/23--5/27/88
	P	TROY-LIBBY	P-1, 14.3 P-1, 19.1 P-56, 33.0	EB WB NB	6/23--6/25/87

MAP 1



1987-88 Weigh in Motion Monitoring Sites

3. Missoula Wye - Unscheduled, intermittent operation only, usually associated with GVW roving officer operation.

4. Circle - Roadway construction adjacent to scale during field season.

In addition, the Seeley-Swan Scale, though not identified in the original Detailed Work Outline was monitored because it had been in regular use since the spring of 1987.

I. Equipment Evaluation

Approach

The evaluation of the WIM equipment, discussed later in this text, was ongoing throughout the data collection phase of this project. It was felt that this approach would take best advantage of the available field time and expose the equipment to the greatest diversity of field situations. Field experience gained simultaneously to monitoring sessions was used to infer practical information relative to accuracy and reliability. Within our capabilities and without robbing from the other topic of this joint inquiry, a thorough equipment evaluation was performed in a "real world" field setting.

Sites were collected with Golden River WIM equipment outfitted with 16.9, 18.0 or 19.0 series software. Installation procedures were made in conformance with the manufacturer's recommendations. All sites were selected for minimal horizontal/vertical curvature and optimal surface conditions.

Calibration

Field experience in the late summer of 1986 indicated that the rate at which target accuracies were achieved dropped by as much as 30% when a previously calibrated mat was installed at a different location. The desirability of calibrating each site is also pointed out in recent WIM Literature (2)(3)(4). In a study published by the Center for Transportation Research (4) Dr. Clyde Lee states that "even though a particular type of WIM system can meet given tolerances at one particular site, this does not necessarily mean that it will

perform within the same tolerances at another location. The variability and systematic bias in weight estimates made by a WIM system can be significantly reduced if the system is properly calibrated at each site where it is used." Montana's experience with WIM equipment supports Dr. Lee's conclusion.

The initial calibration technique used by the Department employed repeated passes with a loaded 3-axle truck of known weight. While this technique achieved a good estimation of static weight for this vehicle, it did not achieve close approximation or consistent estimates of static weights for other trucks in the traffic stream. Because of this, the Department adopted a commonly used method of calibration which is to compare static weights to WIM weights for trucks randomly selected from the site's normal traffic stream. Davies and Sommerville (2) suggest that as many as 150 vehicles are necessary in order to have a high degree of confidence in the calibration (±1%, with 95% confidence). At monitoring sites located on low-volume Primary highways, it could take over a week to obtain that large a sample. It is also important to note that the best available information at the time the "Detailed Work Outline" (1) was written portrayed this type of high-speed, portable WIM equipment as not requiring calibration at each installation.

Because of these constraints on field time and the availability of only one full time employee for the WIM project, a method was developed to "back-calibrate" the data from each installation. This method involved collecting static scale data on each vehicle weighed by the GVW at the static scale house during the WIM monitoring sessions. Gross static weights were later correlated on a PC with WIM weights for individual vehicles through a comparison of axle configurations and the date and time when the records were produced. This method, which makes very conservative use of field time, allowed the development of a compensation factor that was used to "back-calibrate" the WIM truck weights from each scale approach lane through a PC program. The 150 vehicle sample size suggested by Davies and Sommerville (2) was obtained at only 10% of the installations, with 66 heavy vehicle correlations made as an average. The following standard error of the mean calculation with an average standard deviation of 15.5% (weighed for all sites) was used to assess the accuracy of the compensation factors that are used in this study. This calculation shows that the average number of

correlations obtained in this study (66) is sufficient to develop compensation factors for individual installations that are accurate to ±3.7%, with 95% confidence.

This calculation is given by:

$$SEM = \frac{SD}{\sqrt{N}}$$

Where SD = Weighted average Standard Deviation = 15.5%

N = Average Sample Size = 66

$$SEM = \frac{15.5}{\sqrt{66}} = 1.9$$

As confidence limits of 95% are given by ±1.96 * SEM, calculated compensation factors are accurate to ±1.96 * 1.9 = ±3.7% at the 95% confidence level.

The accuracy of the compensation factors can be increased through a larger correlation sample. In order to obtain a larger correlation sample at some low volume locations, a collection session longer than 48 hours would be necessary.

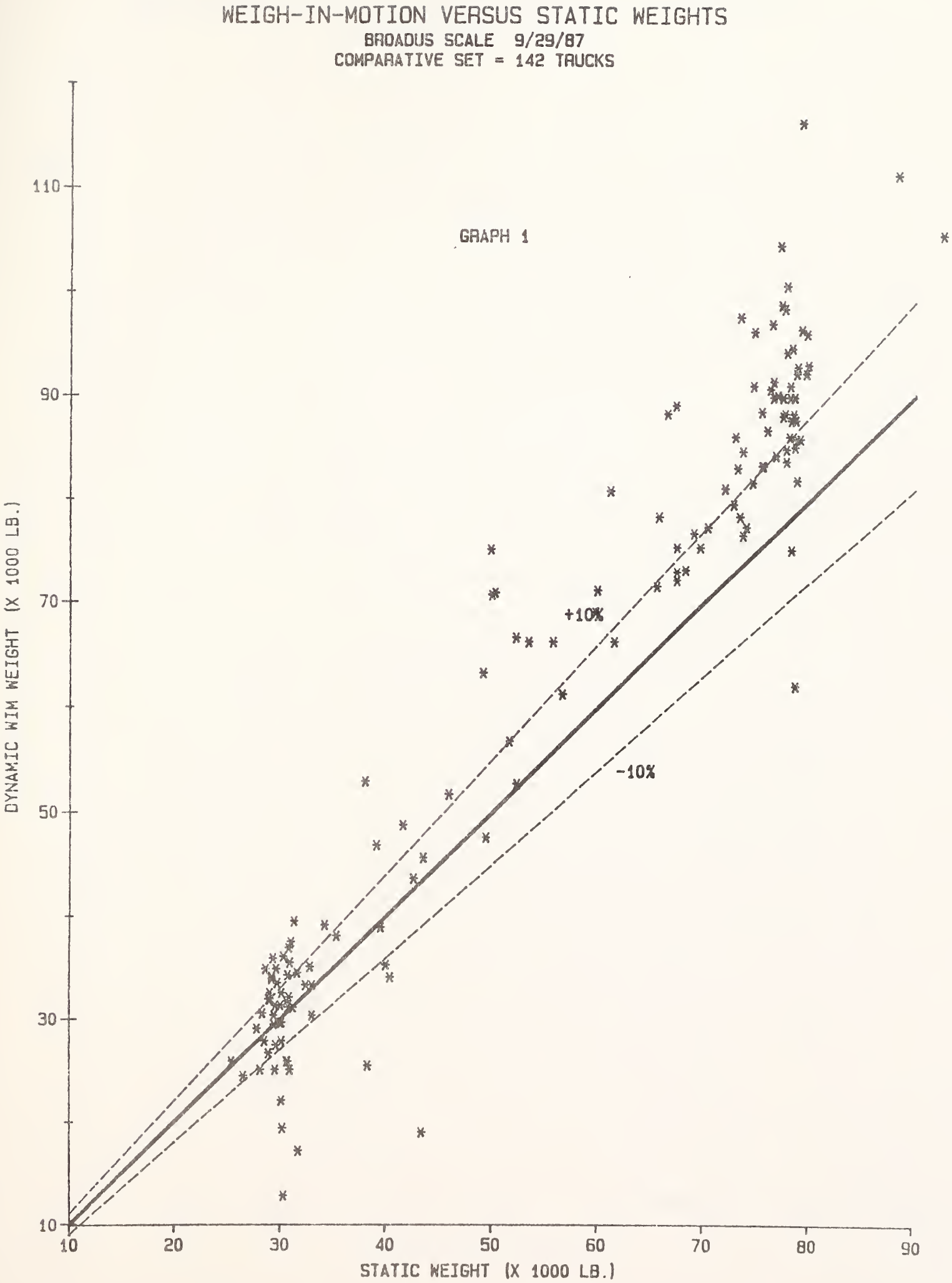
The PC program that actually compensates the raw-WIM weights is based on the following sequential equations:

1. Percentage error for each correlated vehicle = [(WIM-STATIC)/STATIC] * 100 = PE.

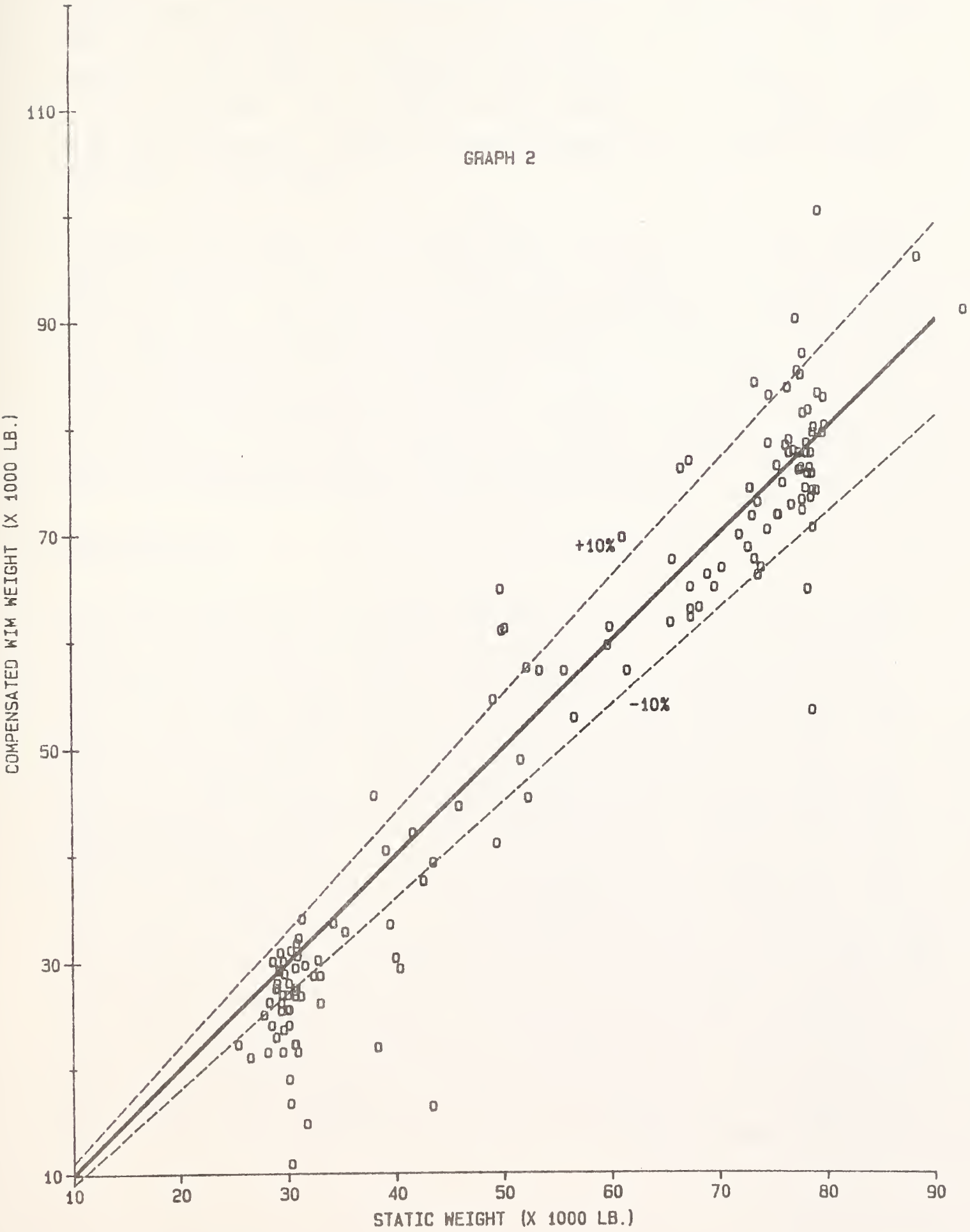
2. Average percentage of error for each set = $1/N \sum_{i=1}^{N} (PE) = APE$

3. Compensated WIM Weight = WIM/(1 + APE/100)

As an example of what this procedure can accomplish, graphs 1 and 2 show a sample of 142 heavy trucks correlated on the north and southbound lanes of the Broadus Scale between 9/29/87 and 10/01/87. Graph 1 shows the raw uncompensated WIM data while Graph 2 shows the improvement possible after back-


WEIGH-IN-MOTION VERSUS STATIC WEIGHTS
BROADUS SCALE 9/29/87
COMPARATIVE SET = 142 TRUCKS
GRAPH 1
+10%
-10%
DYNAMIC WIM WEIGHT (X 1000 LB.)
STATIC WEIGHT (X 1000 LB.)
10
30
50
70
90
110
10
20
30
40
50
60
70
80
90

COMPENSATED WEIGH-IN-MOTION VERSUS STATIC WEIGHTS
BROADUS SCALE 9/29/87
COMPARATIVE SET = 142 TRUCKS



calibrating the site with correlated WIM and static scale weights. This method cannot be applied as successfully to all scale house locations, but it works well where there are moderate truck volumes and few other reasons for truckers to stop such as rest areas or truck stops in the immediate proximity of the scale house. For the purpose of this study, only gross vehicle weights were back-calibrated. However, the same procedure can be applied to individual axles or axle groups.

In summary, both experience and recent WIM literature point out the need to acquire sufficient static scale reference data to enable calibration at each monitoring site. This data can be collected simultaneously to WIM monitoring with compensation factors developed later through a PC program. While this approach optimizes available field time by allowing the collection of calibration data and the monitoring session to proceed simultaneously, it can't be easily applied to all sites. Further, this approach requires excellent cooperation between GVW officers and the WIM technician.

Weight Accuracy

The static scale data also allowed inferences to be made regarding equipment accuracy. While there are currently no universally accepted performance standards for the accuracy of WIM systems, the proposed Heavy-vehicle Electronic License Plate (HELP) target accuracies for gross vehicle weights over 10,000 pounds collected on high-speed portable WIM equipment that were published in Appendix C of the May 1988 Automated Traffic/Truck Weight Monitoring Equipment (Iowa-Minnesota Demonstration Project) are being used as a comparative standard (3). As pointed out in this study, systematic error is described by the mean of the differences between static and WIM weights and random error is described by the standard deviation of this distribution. The draft HELP accuracy specifications for vehicle weights over 10,000 pounds that are measured at speeds greater than 40 MPH are (+) or (-) 5% for systematic error (mean of the weight difference distribution) and 12% for random error (standard deviation of the weight difference distribution). Table 2 shows the comparison of several subsets of the WIM data collected for this project to these targets. For loaded five-axle semis and above the systematic error was

TABLE 2
ACCURACY COMPARISON OF MDOH WIM DATA TO HELP STANDARDS

	MEAN OF STATIC VS WIM DIFFERENCE DISTRIBUTION (WEIGHTED AVG OF ALL SITES)	% OF SITES MEETING HELP TARGET	ABSOLUTE MINIMUM MEAN FOR A SITE	ABSOLUTE MAXIMUM MEAN FOR A SITE	STANDARD DEVIATION OF STATIC VS. WIM DIFFERENCE DISTRIBUTION (WT. AVG.-ALL SITES)	% OF SITES MEETING HELP TARGET	% OF SITES WITH STANDARD DEVIATION ≤ 15% (3% ABOVE HELP TARGET)	MINIMUM STANDARD DEVIATION FOR A SITE	MAXIMUM STANDARD DEVIATION FOR A SITE
HELP ACCURACY STANDARDS FOR TOTAL VEHICLE WEIGHTS	5%				12%				
COMPENSATED WIM WEIGHTS: LOADED 5-AXLE SEMIS AND ABOVE	-0.03%	100%	0.0%	1.8%	12.3%	53%	82%	4.6%	22%
COMPENSATED WIM WEIGHTS: PICK-UP TRUCKS AND ABOVE	-.92%	100%	0.11%	4.61%	15.5%	18%	47%	7.7%	40%
UNCOMPENSATED "RAW" WIM WEIGHTS: PICK--UP TRUCKS AND ABOVE	4.8%	37%	.01%	32.9%	18.6%	6%	24%	7.2%	54%
	SYSTEMATIC ERROR				RANDOM ERROR				

-0.03% (back-calibrated data, weighted for all sites) and the random error was 12.3% (back-calibrated data, weighted for all sites). As the Table shows, the best results (i.e., those closest to the HELP targets) were obtained when the analysis was restricted to trucks having similar loading and axle configurations (i.e. loaded truck classes of 5-axle semis and above). This is not a surprising result, as individual vehicle dynamics is an important error component, a component that would be minimized if the loading and axle configurations of vehicles in the data set being analyzed were similar.

The systematic error (mean of differences) for this equipment is manageable and can in fact be nearly eliminated, if a large enough comparative static weight sample is collected to allow the development of a statistically valid compensation factor. While the systematic errors are quite good overall, they describe an entire sample and are the result of the cancellation process inherent in developing a mean. For example, two individual errors of +20% and -20% respectively, average to 0% error. For individual vehicles, the static versus WIM weight difference can occasionally be as great as (+) or (-) 100%. Clearly, this equipment must be used with caution if inferring weights for individual vehicles.

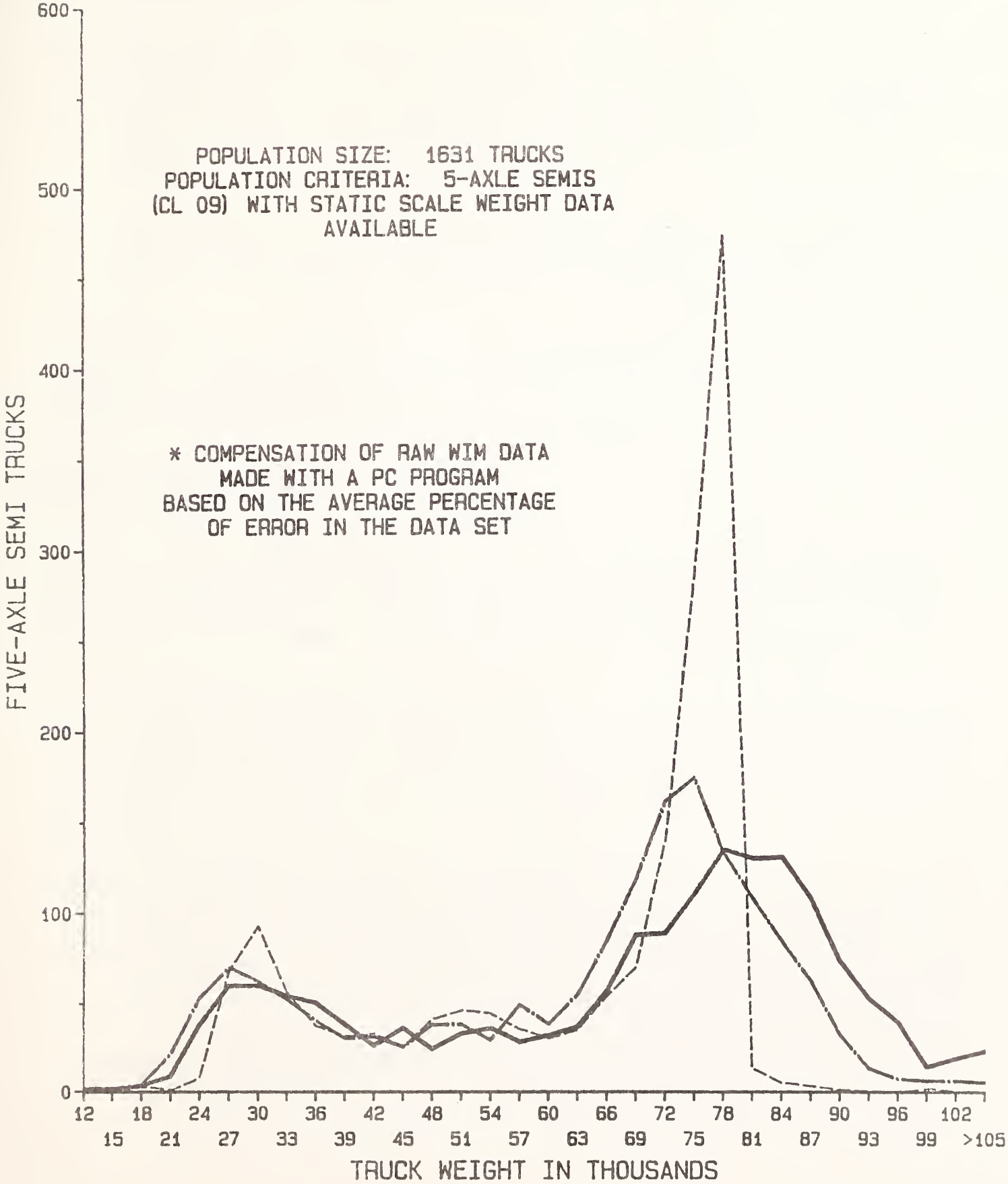
The random error as described by the standard deviation meets or exceeds the target accuracy at only 53% of the monitored sites in the most favorable subset (see Table 2). This statistical measure indicates how widely dispersed the error differences are around the sample's compensated mean. Quantitatively speaking, only 53% of the sites had 68% of the data (1 standard deviation) with WIM weights that were within ±12% of corresponding static scale weights.

These accuracies can be compared to test results from the Maine FHWA Demonstration Project #966 that evaluated six types of WIM equipment on the market (5). THe Maine project found an uncompensated 22.79% systematic error and a 19.8% random error for all classes of trucks with the Golden River WIM equipment. This compares to MDOH weighted averages of 4.8% (site ranges = .01% to 32.9%) for systematic error and 18.6% (site ranges = 7.2% to 54%) for random error.

Some of the factors that contribute to data error include the roughness and geometry of the roadway, environmental differences such as temperature and crosswinds, and individual vehicle characteristics such as suspension, tire pressure and wheel roundness. In addition, accuracy is influenced by the internal consistency of the equipment. Some sites showed instances of data anomalies in the output. These data anomalies commonly repeated weight values for individual axles or total vehicle weights from truck to truck. Another type of data anomaly only recorded two digit number sequences (such as 05858, 03232, or 01010) for axle and total weights. Episodes where data anomalies were generated seemed to be random though often of significant duration. Regardless of the cause of error, the WIM equipment needs careful site selection, an adequate sample for calibrating each installation and careful, continuous monitoring.

Graph 3 shows the comparison of raw-WIM data to static scale data and compensated or "back-calibrated" WIM data for total vehicle weights of 1631 5-axle semis collected during the 1987 and 1988 field seasons. All the line distributions on this graph are bimodal, with 2 different weight populations. The peaks on the left side of the graph represent the population of unloaded semis, while the peaks on the right represent loaded trucks. The dashed line represents static scale weights. For loaded semis, the static scale line is skewed to the left, with the number of trucks steadily increasing in the weight intervals approaching the legal weight limit for this class of truck: 80,000 pounds. In comparison, the solid line shows the raw-WIM weights collected on the same 1,631 trucks. This raw-WIM distribution is much lower and wider than the distribution of static scale weights. In addition, the raw-WIM data is not skewed, but rather normally distributed with approximately the same number of vehicles in intervals on either side of the mean. While the mode, or data that occurs with the greatest frequency, is relatively the same in both distributions, the raw-WIM distribution locates a larger percentage of the sample in the illegally overweight ranges. The dashed-dot distribution line on the graph is somewhat more heightened than the raw-WIM distribution and more flattened on the right. This line demonstrates the amount of correction the "back-calibrating" method achieves. While the peak of this line is more accentuated, it does not closely reflect the height of the static scale line, which is the weight distribution line being estimated.

WEIGHT DISTRIBUTIONS FOR 5-AXLE SEMI TRUCKS
RAW WIM VS STATIC SCALE AND COMPENSATED WIM WEIGHTS
GRAPH 3



RAW WEIGH-IN-MOTION DATA ———

STATIC SCALE WEIGHT DATA - - - - - -

COMPENSATED WIM WEIGHTS * —·—·—

These distributions show:

1. The WIM equipment records many legal trucks in illegal weight intervals.

2. The shape of the distribution is not greatly improved by developing a compensation factor and applying it to the raw-WIM data. This implies that estimating static weights for individual vehicles from even compensated WIM data is inappropriate.

3. The calculation of ESAL's will be higher if developed from WIM data because of the larger number of heavier axles in the WIM data set.

The WIM and static truck weights used to develop this graph can be found in Appendix 1. Other data collected during the course of this study is on file in the Program Development Division of the Montana Department of Highways.

Use for Pavement Design

The conversion of WIM individual axle grouping data into equivalent single-axle loads (ESAL's) will tend to result in larger ESAL's than if developed from static scale weights. This is true for the following reasons.

1. As graphically shown in Graph 3, the same set of heavy vehicles will have a normal distribution for WIM weights versus a left-skewed distribution for static weights; thus placing many WIM weights in the heavier weight ranges.

2. As pointed out by an Idaho Transportation Department (6) physical weight calculation, in a dynamic mode, without considerations of random error, the front axle will always weigh lighter than a comparable static weight, while the drive and trailer axles will always weigh heavier due to wind pressure and engine torque. This confirms what was observed in the data for this study, where leading axles are recorded consistently light and drive and trailer axles are recorded consistently heavy.

3. As pointed out by Marc Hallenbeck of the Washington State Transportation Center in correspondence to FHWA (7), if data sets developed from static scales and WIM scales respectively are placed into an ESAL calculation, the "WIM data will produce a higher estimate per vehicle because of the larger number of very heavy axles in the WIM data set," even if the average of WIM axle weights is the same as the average of static axle weights. Mr. Hallenbeck's clear problem statement attributes this to the fourth power law which "causes the axles over-estimated by WIM equipment to more significantly impact the calculation of average ESAL/truck than the same number of underestimated axles."

Historically, the function for converting axle groupings into ESAL's was empirically developed through the evaluation of static scale base data. Mr. Cleverdon's report for the Idaho Transportation Department (6) states that "trying to calculate static weight from measured dynamic weight is not feasible." The question that follows is if it's feasible to calculate a function based on static weights with measured dynamic weight input? If dynamic weights are going to be used to develop ESAL's, perhaps the ESAL equivalence factors will have to be changed or a new function empirically developed.

Table 3 shows ESAL's developed from MDOH WIM data compared to ESAL's developed from MDOH static scale data. Even though the data sets do not necessarily contain the same vehicles, it was felt a good comparison was possible because of the large number of vehicles in both the static-scale and the WIM Data sets, 22,210 and 24,833 vehicles respectively. In this table the WIM ESAL's were reduced by 05% to compensate for an estimated systematic error in axle weight data. As is apparent by the substantially higher WIM ESAL's in the heavier truck classes, pavement design based on this data will result in increased pavement thicknesses. This may be attributed to either error in the data or the above listed reasons. While FHWA currently believes that "the precision of existing (WIM) equipment exceeds the sensitivity required for current design procedures" (7), the findings of this and similar studies suggest the need for FHWA to investigate the effects of equipment precision on pavement design, as any increase in pavement thicknesses resulting from WIM developed ESAL's will impact a state's construction program.

TABLE 3
COMPARISON OF ESAL'S DEVELOPED FROM STATIC-SCALE VS WIM DATA

		FLEXIBLE (STATIC-SCALE) N=22,210	FLEXIBLE (WIM) N=24,833	RIGID (STATIC-SCALE) N=22,210	RIGID (WIM) N=24,833
CL 05:	2-AXLE, 6-TIRE, SINGLE UNIT TRUCKS	.33	.55	.32	.53
CL 06:	3-AXLE SINGLE UNIT TRUCKS	.47	.51	.62	.78
CL 07:	4 OR MORE AXLE SINGLE UNIT TRUCKS	1.60	1.12	2.1	2.13
CL 08:	4 OR LESS AXLE SINGLE TRAILER TRUCKS	.59	.59	.59	.63
CL 09:	5-AXLE SINGLE TRAILER TRUCKS	1.50	2.51	2.37	4.17
CL 10:	6 OR MORE AXLE SINGLE TRAILER TRUCKS	1.43	1.71	2.04	3.09
CL 11:	5 OR LESS AXLE MULTI-TRAILER TRUCKS	1.71	3.49	1.60	3.49
CL 12:	6 AXLE MULTI-TRAILER TRUCKS	1.77	2.16	1.88	2.39
CL 13:	7 OR MORE AXLE MULTI-TRAILER TRUCKS	1.61	3.17	2.26	4.10
		FLEXIBLE		RIGID	

Classification Accuracy

The following are general observations made after comparing vehicle classifications from the high-speed portable WIM equipment with both visual classifications and a computer-generated classifications based on axle numbers and spacing.

1. Five-axle semis (Class 09) are consistently classified correctly.

2. Recreational vehicles are incorrectly classified as four or less axle semis (Class 08) or buses about 12% of the time.

3. Statewide, it's estimated that complete misses occur on an average of 10% of the traffic stream. Misses are apparently caused by two situations:

   A. Vehicles that travel too far away from the outside wheel path and result in a poor strike or a no strike on the weigh mat.

   B. Vehicles that travel in queues and occasionally don't allow sufficient time between strikes for the equipment to reset itself. This has been observed with both trucks and passenger vehicles.

4. About 50% of the five or less axle multi-trailer trucks (Class 11) and a small percentage of the seven or more axle multi-trailer trucks (Class 13) are misclassified. In this error, the combination vehicle is classified as two separate vehicles, usually a four or five-axle semi (Class 08 or 09) followed by either a pickup (Class 03) or a two-axle single unit truck (Class 05).

The above suggests that further consideration should be given to combining some of lower classes in the 13 category scheme F classification in order to allow for better definition of regionally significant heavy vehicle axle configurations.

Equipment Reliability and Maintenance

From the beginning of intensive data collection in June 1987 through the completion of data collection in July of 1988, there were numerous instances of down time due to equipment failure. The cause of this down time was often traced to the oscillator component of the WIM system. At various times during the data collection phase, up to 3 oscillators were simultaneously malfunctioning. We were told by the manufacturer that the units were unfixable and that they would have to be replaced for approximately $600 each. Fortunately, a MDOH Instrument Repair Worker was able to produce a schematic and repair the oscillators for less than 10% of the manufacturer's estimate. Oscillator failure continues to be an ongoing problem and may be the result of direct hits to the oscillator end of the capacitance mats from heavy vehicles.

Equipment problems associated with heavy rains were common, but were usually temporary in nature. Rain-related problems included the loss of temporary inductance loops from relatively porous pavements such as open graded friction course surfaces and gaps in the data apparently caused by moisture entering the electrical connections. However, one of the data recorder boxes was severely damaged due to water leakage during a heavy rain storm. This box required extensive repair and was not available for field use during a prolonged period.

The capacitance mats are susceptible to damage from heavy trucks. At one location, a mat was damaged after a trucker apparently tried to rip the mat off the pavement with brake-locked wheels. At this time, a method for repairing this mat has not been found.

Installation time is about 3½ to 4 man hours per lane, without troubleshooting. This figure agrees with the installation time cited in the Maine demonstration project (5) and can be reduced if more than one technician is available to work on the installation. The average installation time has been somewhat reduced during the course of the project through acquired experience. See Table 4 for a breakdown of the time required for each task involved in a typical installation of a lane. Times used for troubleshooting weren't

TABLE 4

AVERAGE TIMES BY TASK FOR WIM EQUIPMENT INSTALLATION

FLAG/CONE SET-UP MOVING AND BREAKDOWN	1 HR
LOOP CONSTRUCTION (2 LOOPS)	1.5 HR
MAT/OSCILLATOR SET UP (1 MAT)	.75 HR
HARNESS WIRING	.3 HR
FORMAT RECORDER/DOCUMENTATION	.2 HR
AVERAGE TIME/LANE	3.75 HR

included in Table 4 because of the variability of possible problems encountered in the field. However, on occasion, it takes hours to locate a problem and correct it. Further, if electronic testing equipment is not available in the field or if the WIM technician has only minimal electronics expertise, troubleshooting and problem solving is only possible if backup equipment is available for rotation into the site.

Equipment Evaluation Summary Points

1. Each installation should be calibrated if possible. The method used in the study was to develop a compensation factor for the WIM vehicle weights based on as large a sample of static reference weights as could be obtained during the 48 hours of WIM monitoring. This data was then manipulated on a PC program.

2. Calibrated data subsets consisting of loaded 5-axle semis and above (Class 09 through Class 13) meet the HELP targets for systematic error 100% of the time and random error 53% of the time, with a weighted average standard deviation of 12.3% and a weighted average distributional mean of -0.03%.

3. The WIM weight distribution for heavy trucks is normally distributed while the static weight distribution for the same set of vehicles is skewed to the left. This implies that the WIM equipment will record many legal trucks in illegal weight intervals.

4. Equivalent single axle loads will tend to be greater when calculated from WIM data than when calculated from static weight data.

5. Five-axle semis (Class 09) are generally classified correctly while recreation vehicles and some trucks with multi-trailer units are frequently misclassified.

6. Frequent equipment maintenance problems occur with the oscillator components.

7. Equipment down time has been attributed to heavy rains, direct impact from heavy vehicles to oscillators and damage to mats from brake-locked wheels.

8. Average installation time is approximately 3½ to 4 man hours per lane without troubleshooting.

II. SCALE AVOIDANCE

Approach

The 21 Interstate and Primary scale houses identified on Map 1 were monitored for an average of 48 hours each. The length of the monitoring session was reduced from the seven continuous days identified in the original work outline (1) to accommodate travel times between sites and time requirements for site installations that were longer than originally anticipated. Of these sites, 12 included at least one weekend day in the session. The pattern of statewide collection was determined by weather patterns, GVW schedules and the number of WIM units in operating condition. While the original plan (1) was to monitor potential by-pass lanes as well as scale approach lanes, this was abandoned in favor of visual observation or pneumatic classification tubes on potential by-pass routes. This change in approach was based on the need to reserve equipment for back-up, initial underestimates of equipment installation time and gravel surfacing on many by-pass roads prohibiting equipment installation.

Analysis

Three assumptions were made for this analysis. The first was that the systematic error in vehicle weights was being managed through the "back-calibrating" method described. Secondly, that the rate of random error in the data set was fairly constant throughout the monitoring session. Thirdly, that the axle count and vehicle length information in the data sets was reliable as indicated by a review of 5-axle semi data. Software programs were written in dBase III+ to accomplish the following tasks: 1) convert raw WIM data into dBase III+ data base files; 2) compile individual data bases into master files

for lanes and sites; 3) assign an adjusted WIM weight to each vehicle based on a correction factor developed by comparing WIM weights to static scale weights collected at each site; 4) formulate a standard deviation for the percent error distribution of each monitored lane; 5) assign an "open" or "closed" flag to each vehicle based on scale house hours of operation during each monitoring session; 6) assign a targeted legal weight to each vehicle as computed by the bridge weight formula and based on the length of the vehicle and the number of axles in the data; 7) compare the adjusted WIM weight to the formulated legal weight of each vehicle and flag probable overweight trucks; and 8) lastly, formulate the proportion of illegal trucks to all trucks in the traffic stream for the open versus closed scale periods and check for a statistically significant difference between the two. The statistical test for the significance of the differences between proportions is given by a standard error of:

$$SE = \sqrt{Pq\ (1/N_1 + 1/N_2)}$$

Where P = The percentage of heavy vehicles that were determined to be probable illegals in the set

q = 1-P

N_1 = Total number in the open scale sample

N_2 = Total number in the closed scale sample

The test for a statistical difference between the proportion of probable illegals in the open scale periods versus the closed scale periods was taken at the 90% confidence level (8).

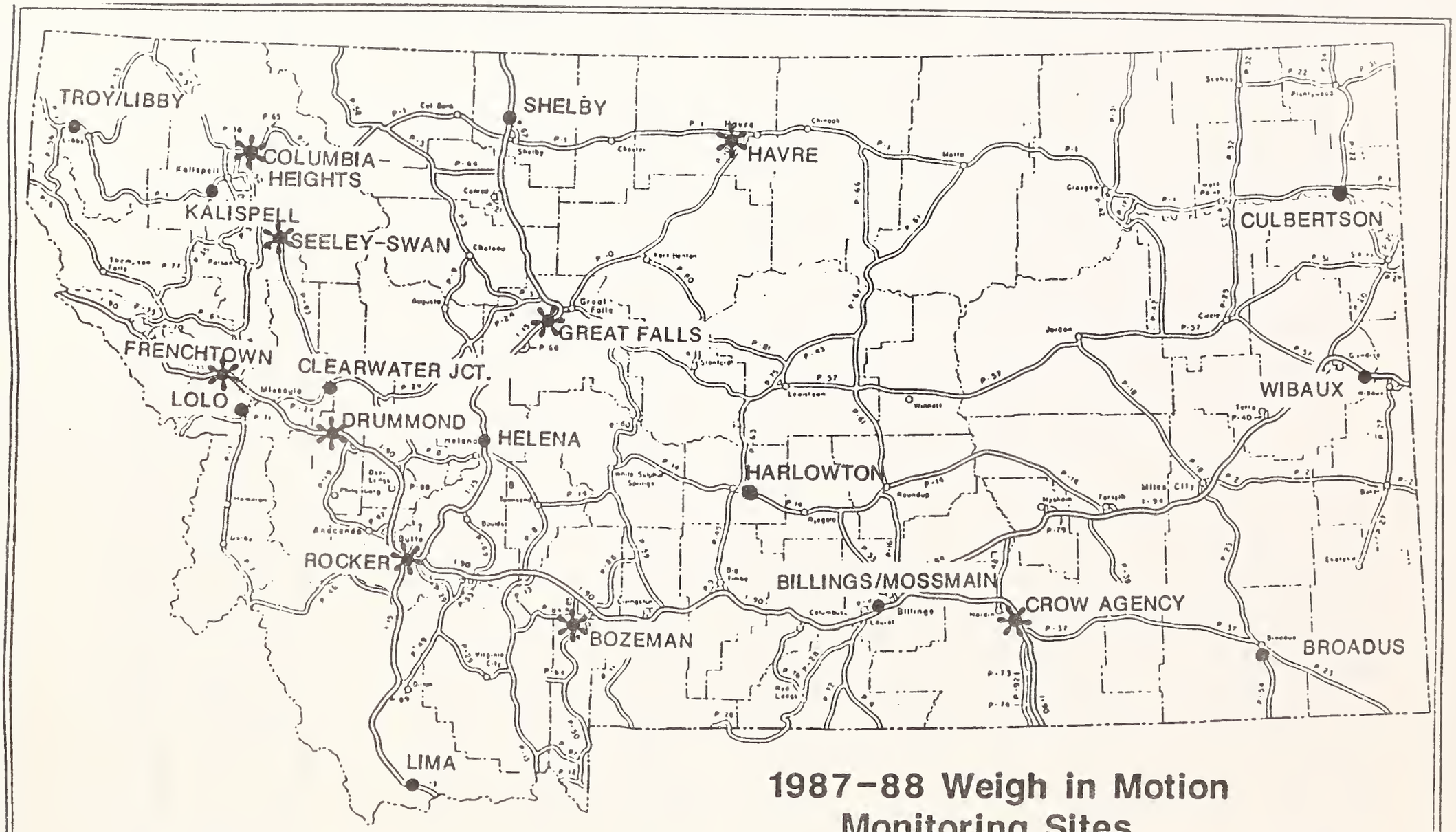
Results

The summary results of this monitoring are shown in Table 5 and on Map 2, where the starred locations identify scale houses where the proportion of illegal trucks was significantly higher during closed scale periods at the 90% confidence level. At 43% of the monitored scales, the proportion of illegal trucks to all trucks during the closed scale periods was more than could be attributed to sampling error. While a statistically valid difference between

TABLE 5
SUMMARY RESULTS OF MDOH MONITORING FOR WEIGH SCALE AVOIDANCE

	NUMBER OF SCALES MONITORED	NUMBER WITH SIGNIFICANT DIFFERENCE IN PROBABLE ILLEGAL RATES WHEN CLOSED	NUMBER WITH NO SIGNIFICANT DIFFERENCE IN PROBABLE ILLEGAL RATES WHEN CLOSED
INTERSTATE	9	5	4
PRIMARY	12	4	8
TOTAL	21	9	12

MAP 2



1987-88 Weigh in Motion Monitoring Sites

* STATISTICALLY SIGNIFICANT DIFFERENCE IN RATES OF ILLEGAL TRUCKS DURING CLOSED HOURS OF WIM MONITORING

open and closed periods can be shown to exist, precise figures describing the actual number of illegal vehicles in the traffic stream requires a better estimation of static scale weights than can be achieved with this system of weighing. In addition, the duration of the monitoring sessions was too short to reflect traffic patterns that in some areas are based on weekly or yearly cycles. Despite these limitations, some inferences can be drawn from the data:

1. Trucks running with illegal weights occur at a higher rate on the Interstate than on the Primary.

2. Trucks running with illegal weights occur at a higher rate on I-90 than either I-15 or I-94.

3. On Primary highways, trucks running with illegal truck weights occur at a higher rate in the western part of the state than in the east.

It was also concluded that where scale avoidance occurs, it can be attributed more commonly to avoiding open scale periods than avoiding scale locations. In other words, rerouting over by-pass roads is not a common problem in Montana. This is understandable, as acceptable by-pass routes are only rarely present, a different situation than that found in more densely roaded states. Through observation and GVW officer interview, it was determined that in the western part of the state, the trucks most likely to avoid the scales by taking alternate routes are loaded logging trucks followed by heavy equipment haulers and loaded farm/ranch vehicles. In the eastern part of the state, the vehicles most commonly avoiding the scale houses were 2 and 3 axle locally-owned ranch vehicles, whose drivers falsely assume they don't have to stop at the scale houses. The best estimate of avoidance via alternate route during open scale periods is less than 2% of the heavy truck traffic. Two incidents of truckers by-passing scale locations were observed in the field. In one case the by-pass was motivated by the desire to avoid a vehicle inspector and in the other case by the desire to avoid problems over vehicle registration. In both cases, when the trucks were escorted back to the static scales they were found to be legally loaded.

The following general statements describe observations made relative to patterns of truck movement on the state's highway systems.

1. West bound Interstate truck traffic increases on the weekends as thru-state truckers target Monday morning for picking up return freight from Seattle loading docks.

2. North-South Interstate truck traffic increases midweek.

3. In areas where logging accounts for the majority of heavy truck traffic on the Primary System, these trucks run almost exclusively Mondays through Fridays. For example, the Kalispell scale site was recorded from mid-day Friday, June 26, through mid-day Monday, June 29. Trucks in excess of 70,000 pounds total weight (maximum legal weight for 5-axle trucks less 1 standard deviation) passed this scale at the rate of approximately 1 per 7½ minutes until approximately 7:30 Friday evening. From on-site observation, these were almost exclusively loaded logging trucks. Between Friday evening and early the following Monday morning, only 4 trucks in excess of 70,000 pounds total weight were monitored. According to our records, these four trucks were running legally. This same pattern is repeated at other Primary route scales in the western part of the state where wood products are moved to mills which are open only during the week. This pattern can be expected to change if mill hours change.

4. In the areas of the state where seasonal agricultural harvests impact Primary truck traffic, rates of truck movement are contingent on grain elevator schedules, typically 7 a.m. to 7 p.m. Monday thru Friday and 8 a.m. to 5 p.m. on Saturdays.

Haulage cycles that impact truck traffic patterns can be found at many scale locations. In order to thoroughly describe these patterns, large blocks of scale house data should be evaluated in conjunction with multiple WIM or visual monitoring sessions.

Scale Avoidance Summary Points

1. Twenty-one static-scale houses were monitored for an average monitoring session of 48 hours.

2. The data was evaluated to check for significant differences in the proportion of probable illegal vehicles in the opened versus closed scale periods.

3. At 43% of the monitored scales, the proportion of illegal trucks to all trucks was greater during the closed scale periods and was more than could be attributed to sampling error.

4. Scale avoidance is more commonly a result of avoiding open scale periods than avoiding scale locations.

5. Scale avoidance occurs more commonly on the Interstate and on routes in the western part of the state.

III. CONCLUSION

Based on the study's results, it's generally concluded that truck weight data generated by this WIM system should not be used where a high level of individual truck weight accuracy is required. This implies that using the equipment for weight enforcement is not an appropriate application for this system. Further, it's felt that some questions should be resolved regarding the necessary level of equipment precision before the data can be incorporated into pavement design procedures. However, because the average vehicle weights developed with this system are reliable, it suggests that there are systems level planning applications for this data.

Although the analysis showed that at 43% of the monitored scales the proportion of illegal trucks to all trucks was significantly greater during the closed scale periods, the actual number of illegally running trucks may be quite small, as a small number of illegal trucks will become a large percentage of total truck volume during a very low traffic period.

Finally, throughout the course of this 18-month study, different approaches to accuracy standards and calibration techniques were advanced in the WIM literature. Apparently, there is now progress being made towards standardizing accuracy expectations, calibration procedures, and acceptance standards. We found the draft HELP specifications (3) for high-speed portable WIM gross vehicle weights to be useful in analyzing the data collected in this study. It is hoped that performance specifications can be adopted in the near future. It seems that standardization is a prerequisite to further progress with "WIM" as a technology and a tool.

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APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/03/10	14:12:25.0	071	32526	38960	-16.51
87/03/10	14:19:57.0	075	67392	68880	-2.16
87/03/10	14:29:36.6	026	62010	51940	19.39
87/03/10	14:49:54.7	061	57798	58400	-1.03
87/03/10	14:59:39.5	059	31590	33280	-5.08
87/03/10	15:15:24.0	056	89154	79540	12.09
87/03/10	15:19:24.8	067	62010	59900	3.52
87/03/10	15:29:51.1	056	77220	73260	5.41
87/03/11	10:02:49.0	066	131274	80880	62.31
87/03/11	10:02:56.0	058	88920	71960	23.57
87/03/11	11:16:49.0	058	75582	74080	2.03
87/03/11	11:17:51.1	058	36270	33960	6.80
87/03/11	11:18:05.0	053	70668	62700	12.71
87/03/11	11:21:00.6	059	36504	32480	12.39
87/03/11	11:24:23.0	082	83538	78840	5.96
87/03/11	11:45:21.7	071	45630	50060	-8.85
87/03/11	11:53:20.0	057	40716	37960	7.26
87/03/11	11:59:23.9	062	41184	35100	17.33
87/03/11	12:26:34.0	058	83772	77740	7.76
87/03/11	12:36:44.4	054	80262	74180	8.20
87/03/11	13:10:52.0	060	87750	79880	9.85
87/03/11	13:29:05.3	061	32526	32460	0.20
87/03/11	13:43:56.0	063	75114	75520	-0.54
87/03/11	13:45:01.0	048	76986	76880	0.14
87/03/11	13:48:31.8	059	73944	71220	3.82
87/03/11	14:09:03.0	053	83538	78940	5.82
87/03/11	14:10:12.5	056	71838	69680	3.10
87/03/11	14:19:11.8	062	80028	81420	-1.71
87/03/11	14:19:28.4	068	75816	81120	-6.54
87/03/11	14:19:45.1	062	91494	79660	14.86
87/03/11	14:30:18.6	058	48438	46940	3.19
87/03/11	14:37:56.8	054	74412	77380	-3.84
87/03/11	15:01:48.9	060	99216	77880	27.40
87/03/11	15:14:53.6	064	87984	77900	12.94
87/03/11	15:29:48.0	058	78156	78620	-0.59
87/03/11	15:45:36.0	055	87984	73620	19.51
87/03/11	16:24:50.0	057	83538	79700	4.82
87/03/11	16:28:11.6	048	84474	78240	7.97
87/03/11	16:43:52.4	056	32058	32560	-1.54
87/03/12	10:35:48.0	057	81432	80660	0.96
87/03/12	10:37:55.0	060	91026	78640	15.75
87/03/12	10:42:03.0	045	69264	75480	-8.24
87/03/12	10:46:02.6	055	56394	53800	4.82
87/03/12	10:56:57.4	055	68796	72400	-4.98
87/03/12	11:06:25.0	066	41184	32460	26.88
87/03/12	11:11:06.7	070	31122	34160	-8.89

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/03/12	11:42:10.9	055	44226	35720	23.91
87/03/12	12:00:34.4	060	74412	79640	-6.56
87/03/12	12:24:56.0	056	91728	74300	23.46
87/03/12	12:27:31.9	070	33228	32940	0.87
87/03/12	12:27:50.0	067	89154	72560	22.87
87/03/12	12:33:41.1	030	88218	77880	13.27
87/05/26	14:43:27.7	059	40602	49500	-17.98
87/06/25	10:53:23.8	076	24800	27640	-10.27
87/06/25	10:57:44.0	045	32292	37620	-14.16
87/06/25	11:00:16.5	030	67600	67720	-0.18
87/06/25	11:20:53.6	039	38610	31560	22.34
87/06/25	11:26:01.0	050	84006	80980	3.74
87/06/25	11:27:19.6	054	77662	77320	0.44
87/06/25	11:31:39.0	045	68400	75080	-8.90
87/06/25	11:41:05.9	060	79400	73400	8.17
87/06/25	11:46:35.6	050	25740	36380	-29.25
87/06/25	12:11:08.0	048	84006	79480	5.69
87/06/25	12:18:58.0	056	23278	29680	-21.57
87/06/25	12:30:37.9	032	67000	79800	-16.04
87/06/25	12:37:51.0	037	24102	26980	-10.67
87/06/25	12:40:17.0	050	70400	78900	-10.77
87/06/25	13:20:23.3	057	29800	33760	-11.73
87/06/25	13:28:35.0	054	26600	35540	-25.15
87/06/25	13:34:11.0	053	62800	76000	-17.37
87/06/25	13:42:54.9	042	41652	38260	8.87
87/06/25	14:18:20.7	014	76752	78920	-2.75
87/06/25	14:28:24.0	060	66538	64840	2.62
87/06/25	14:36:55.0	009	74800	79840	-6.31
87/06/25	14:49:41.0	058	69216	73260	-5.52
87/06/25	15:09:48.0	050	58968	78620	-25.00
87/06/25	15:16:51.0	027	70658	77000	-8.24
87/06/25	15:21:54.8	072	67800	77780	-12.83
87/06/25	15:33:04.0	043	41418	38220	8.37
87/06/26	13:22:19.2	016	87600	80180	9.25
87/06/26	13:22:37.0	069	74800	79580	-6.01
87/06/26	13:26:33.4	056	74000	76260	-2.96
87/06/26	13:40:57.1	052	95000	79660	19.26
87/06/26	13:44:36.9	059	78200	78820	-0.79
87/06/26	13:51:50.3	052	72400	80140	-9.66
87/06/26	14:15:04.6	053	76400	78900	-3.17
87/06/26	14:27:42.6	058	89200	79440	12.29
87/06/26	14:29:58.6	048	70200	84500	-16.92
87/06/26	14:37:18.2	043	86000	79660	7.96
87/06/26	14:50:26.5	053	78400	79400	-1.26
87/06/26	15:12:38.2	041	43600	26480	64.65
87/06/26	15:20:52.1	051	80000	79060	1.19

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/06/26	15:27:01.0	051	91600	78260	17.05
87/06/26	15:28:51.0	057	64000	68080	-5.99
87/06/26	15:28:56.7	058	40200	54840	-26.70
87/06/26	15:34:04.4	053	73800	79560	-7.24
87/06/26	15:50:37.6	009	109000	79900	36.42
87/06/26	16:01:30.0	050	77400	78660	-1.60
87/06/26	16:06:51.2	054	94400	78160	20.78
87/06/26	16:14:07.5	056	81000	79460	1.94
87/06/26	16:15:57.0	032	83800	76000	10.26
87/06/26	16:17:35.4	018	91200	77180	18.17
87/06/26	16:17:38.7	047	87400	80500	8.57
87/06/26	16:23:22.0	049	106000	80620	31.48
87/06/26	16:28:17.0	049	81200	78180	3.86
87/06/26	16:30:34.5	053	95800	79420	20.62
87/06/26	16:40:54.0	021	94200	79120	19.06
87/06/29	08:34:22.0	053	102200	81640	25.18
87/06/29	08:42:12.9	048	91000	79260	14.81
87/06/29	08:52:42.0	023	65200	79840	-18.34
87/06/29	09:04:20.8	048	95400	79120	20.58
87/06/29	09:14:23.9	066	78600	79420	-1.03
87/06/29	09:17:10.0	048	94200	79460	18.55
87/06/29	09:25:30.0	060	94000	79560	18.15
87/06/29	09:32:32.0	057	91600	79280	15.54
87/06/29	09:44:47.5	050	72000	76280	-5.61
87/06/29	09:48:10.0	057	47200	44320	6.50
87/06/29	10:08:29.2	052	93400	79820	17.01
87/06/29	10:09:01.0	061	86000	78120	10.09
87/06/29	10:10:01.1	066	72600	80300	-9.59
87/06/29	10:10:30.3	052	63200	80280	-21.28
87/06/29	10:22:03.6	053	83600	79980	4.53
87/06/29	10:22:25.2	048	85200	79040	7.79
87/06/29	10:22:34.7	048	91600	79920	14.61
87/06/29	10:25:22.0	043	71400	74040	-3.57
87/06/29	10:34:43.0	057	94200	80380	17.19
87/06/29	10:39:38.0	055	77200	79040	-2.33
87/06/29	10:43:05.1	030	64400	72420	-11.07
87/06/29	10:47:46.1	101	60800	79620	-23.64
87/06/29	11:00:57.0	050	50800	48900	3.89
87/06/29	11:07:14.3	053	68600	63240	8.48
87/06/29	11:07:26.1	047	44600	56420	-20.95
87/06/29	11:13:02.0	060	90600	79800	13.53
87/06/29	11:17:57.9	058	80600	76380	5.53
87/06/29	11:30:09.9	057	91000	79900	13.89
87/06/29	11:41:10.0	060	86200	78640	9.61
87/06/29	11:51:23.0	058	82400	79220	4.01
87/06/29	12:32:29.0	055	80000	80520	-0.65

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/06/29	12:33:33.0	053	77800	77520	0.36
87/06/29	12:43:42.9	061	73200	74680	-1.98
87/06/29	12:44:23.7	049	90400	80880	11.77
87/06/29	12:45:33.0	053	87000	80060	8.67
87/06/29	13:01:30.5	053	83000	80040	3.70
87/06/29	13:13:37.0	048	78600	79320	-0.91
87/06/29	13:18:39.4	048	83600	79300	5.42
87/06/29	13:19:38.0	054	82800	80000	3.50
87/06/29	13:41:36.0	053	81000	79240	2.22
87/07/09	09:59:53.8	061	97554	79800	22.25
87/07/09	09:59:59.4	063	79662	70520	12.96
87/07/09	10:03:52.9	063	91377	77480	17.94
87/07/09	10:06:22.0	060	85626	75980	12.70
87/07/09	10:08:32.8	054	35997	39640	-9.19
87/07/09	10:22:01.0	065	63261	73020	-13.36
87/07/09	10:27:09.0	071	81153	72840	11.41
87/07/09	10:32:43.3	057	94146	77620	21.29
87/07/09	10:36:42.0	057	83496	76280	9.46
87/07/09	10:38:11.0	056	81153	76120	6.61
87/07/09	10:47:35.0	058	52611	57820	-9.01
87/07/09	10:51:09.0	066	84561	73320	15.33
87/07/09	11:00:28.1	063	77745	79640	-2.38
87/07/09	11:00:50.0	063	85839	70460	21.83
87/07/09	11:05:13.8	065	85413	70460	21.22
87/07/09	11:07:34.8	060	112464	77540	45.04
87/07/09	11:07:38.4	065	83922	77440	8.37
87/07/09	11:08:44.0	066	93294	80240	16.27
87/07/09	11:22:51.8	070	39618	32500	21.90
87/07/09	11:23:11.1	065	94146	78800	19.47
87/07/09	11:23:16.4	059	92655	75140	23.31
87/07/09	11:25:33.0	057	75402	73040	3.23
87/07/09	11:32:39.7	063	76680	78920	-2.84
87/07/09	11:37:41.0	070	73911	74520	-0.82
87/07/09	11:40:51.0	057	74550	58200	28.09
87/07/09	11:41:27.0	060	91164	72680	25.43
87/07/09	11:52:51.8	053	92442	79860	15.76
87/07/09	11:56:02.0	072	38553	39720	-2.94
87/07/09	12:02:46.8	062	81366	77360	5.18
87/07/09	12:02:55.3	062	38766	43000	-9.85
87/07/09	12:13:47.3	046	61344	58960	4.04
87/07/09	12:14:15.0	048	71142	75920	-6.29
87/07/09	12:15:53.4	066	84561	72220	17.09
87/07/09	12:19:02.0	061	86478	71200	21.46
87/07/09	12:24:30.2	062	87330	79840	9.38
87/07/09	12:24:57.0	055	54954	76720	-28.37
87/07/09	12:30:23.0	064	49842	43740	13.95

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/07/09	12:31:51.3	064	74550	68160	9.38
87/07/09	12:37:26.0	058	75828	76560	-0.96
87/07/09	12:38:21.7	036	84561	84200	0.43
87/07/09	12:43:45.5	061	84561	79080	6.93
87/07/09	12:49:52.2	067	94146	77600	21.32
87/07/09	12:50:03.2	068	97767	76420	27.93
87/07/09	12:50:20.9	063	32589	30600	6.50
87/07/13	08:03:48.2	060	32548	29700	9.59
87/07/13	08:12:02.7	058	81576	72700	12.21
87/07/13	08:38:18.0	057	56650	51300	10.43
87/07/13	09:02:28.0	067	85696	79400	7.93
87/07/13	09:04:50.0	062	75602	78200	-3.32
87/07/13	09:05:14.7	062	82606	80200	3.00
87/07/13	09:26:48.4	032	93730	80800	16.00
87/07/13	09:33:51.6	027	90640	79500	14.01
87/07/13	09:52:33.0	061	78692	79000	-0.39
87/07/13	09:54:01.9	058	44084	45700	-3.54
87/07/13	09:58:26.7	059	20394	20200	0.96
87/07/13	10:02:53.0	062	31724	30000	5.75
87/07/13	10:20:44.4	061	29046	35600	-18.41
87/07/13	10:34:12.0	058	28428	31400	-9.46
87/07/13	10:49:45.0	063	74366	69900	6.39
87/07/13	10:55:55.6	063	25750	27900	-7.71
87/07/13	11:14:57.0	057	36668	34600	5.98
87/07/13	11:19:18.8	065	52118	52200	-0.16
87/07/13	11:20:28.0	058	24102	28800	-16.31
87/07/13	11:24:27.0	056	75602	69300	9.09
87/07/13	11:29:37.4	024	78280	78600	-0.41
87/07/13	11:38:55.8	063	64478	67100	-3.91
87/07/13	11:41:10.0	063	70658	72500	-2.54
87/07/13	12:01:10.0	055	39964	41400	-3.47
87/07/13	12:07:48.7	062	72718	80500	-9.67
87/07/13	12:13:15.0	056	69216	77500	-10.69
87/07/13	12:33:58.0	065	70658	80300	-12.01
87/07/13	12:34:39.0	075	25956	28400	-8.61
87/07/13	12:34:48.0	062	36050	31600	14.08
87/07/13	12:44:02.0	024	82400	79100	4.17
87/07/13	12:46:50.6	062	74778	78000	-4.13
87/07/13	12:53:13.0	067	71482	80100	-10.76
87/07/13	12:54:15.1	060	84254	81200	3.76
87/07/13	12:58:30.5	057	35844	24200	48.12
87/07/13	13:30:49.0	057	74160	78900	-6.01
87/07/13	13:54:58.0	059	71070	77600	-8.41
87/07/13	13:55:04.2	063	74366	71300	4.30
87/07/13	13:59:57.2	056	78486	77300	1.53
87/07/13	14:24:02.3	057	83224	78300	6.29

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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/07/13	14:34:36.0	059	76838	80000	-3.95
87/07/13	14:41:54.6	060	82194	79400	3.52
87/07/13	14:58:37.0	057	69216	79500	-12.94
87/07/13	15:26:51.8	054	86726	79900	8.54
87/07/13	15:31:02.1	059	79104	79500	-0.50
87/07/13	15:40:22.4	056	76426	80500	-5.06
87/07/21	13:02:43.2	057	26412	29800	-11.37
87/07/21	13:04:12.9	020	62478	79700	-21.61
87/07/21	13:12:57.9	057	85644	71700	19.45
87/07/21	13:13:30.0	022	92655	77700	19.25
87/07/21	13:14:22.0	050	47712	51100	-6.63
87/07/21	13:25:17.3	060	82644	65300	26.56
87/07/21	13:29:31.3	014	74178	74500	-0.43
87/07/21	13:45:01.8	045	70668	78200	-9.63
87/07/21	13:46:59.7	025	80088	79000	1.38
87/07/21	13:51:11.1	062	71595	80100	-10.62
87/07/21	13:51:16.3	066	71380	78600	-9.19
87/07/21	13:56:48.6	055	82005	76100	7.76
87/07/21	14:04:19.6	056	87505	78600	11.33
87/07/21	14:05:20.0	067	32058	34300	-6.54
87/07/21	14:10:32.6	065	55470	62400	-11.11
87/07/21	14:23:49.7	055	37195	41000	-9.28
87/07/21	14:28:29.0	055	73272	79400	-7.72
87/07/21	14:31:34.4	062	23435	20000	17.18
87/07/21	14:31:41.0	058	27950	20000	39.75
87/07/21	14:31:41.0	004	89154	77900	14.45
87/07/21	14:37:40.0	057	75189	79200	-5.06
87/07/21	14:39:50.1	063	75816	76200	-0.50
87/07/21	14:44:52.0	062	28542	31700	-9.96
87/07/21	16:57:48.1	007	91728	70900	29.38
87/07/21	17:08:25.2	061	45156	44400	1.70
87/07/21	17:14:00.5	065	56975	66100	-13.80
87/07/21	17:25:55.7	053	101814	79600	27.91
87/07/21	17:35:13.2	055	78597	76000	3.42
87/07/21	17:49:04.4	070	67940	77200	-11.99
87/07/21	17:52:22.2	061	79236	79100	0.17
87/07/21	18:05:41.0	052	83922	79700	5.30
87/07/21	18:15:09.8	050	37625	37800	-0.46
87/07/21	18:44:12.2	055	84987	79700	6.63
87/07/21	18:52:14.0	053	92235	81000	13.87
87/07/21	18:54:38.9	046	82218	72600	13.25
87/07/21	19:03:47.9	053	63048	57700	9.27
87/07/21	19:09:32.0	065	79765	77100	3.46
87/07/21	19:10:59.0	054	25800	28700	-10.10
87/07/21	19:16:26.9	047	74976	79800	-6.05
87/07/21	19:18:36.0	050	91377	79200	15.38

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/07/21	19:18:45.0	048	88608	79800	11.04
87/07/21	19:18:50.3	053	24495	32800	-25.32
87/07/21	19:33:39.9	058	78475	78400	0.10
87/07/21	20:09:11.3	055	86904	80300	8.22
87/07/21	20:21:48.5	058	61344	63200	-2.94
87/07/21	20:21:53.2	058	75189	75000	0.25
87/07/21	20:27:03.0	050	83420	77200	8.06
87/07/21	20:37:12.1	052	97180	79100	22.86
87/07/21	20:39:53.2	052	83922	78500	6.91
87/07/21	21:21:43.0	053	37195	30700	21.16
87/07/21	21:49:28.0	057	28542	29200	-2.25
87/07/21	22:05:44.3	053	86904	70000	24.15
87/07/21	22:08:24.7	049	81153	77400	4.85
87/07/21	22:26:40.0	058	41322	39000	5.95
87/07/21	22:42:53.0	053	63048	63900	-1.33
87/07/22	16:12:27.9	058	77220	79140	-2.43
87/07/22	16:17:37.5	061	80940	79120	2.30
87/07/22	16:34:48.2	057	75250	79020	-4.77
87/07/22	16:40:54.5	019	96750	73900	30.92
87/07/22	16:56:40.5	047	76986	78560	-2.00
87/07/22	17:10:43.0	053	68799	80520	-14.56
87/07/22	17:15:54.0	058	85878	79060	8.62
87/07/22	17:31:15.0	065	66220	73540	-9.95
87/07/22	17:36:23.0	073	77106	79140	-2.57
87/07/22	17:48:52.0	063	32802	35360	-7.23
87/07/22	17:48:52.6	074	85355	83820	1.83
87/07/22	18:10:49.0	062	37488	46860	-20.00
87/07/22	18:22:32.8	061	81700	71980	13.50
87/07/22	18:27:09.7	066	94359	78600	20.05
87/07/22	18:41:38.0	063	102027	78160	30.54
87/07/22	18:48:25.0	057	77532	79300	-2.23
87/07/22	18:49:33.0	063	80940	78060	3.69
87/07/22	18:54:47.0	032	96489	79720	21.03
87/07/22	19:02:26.6	055	37275	48300	-22.83
87/07/22	19:02:41.0	053	45795	45640	0.34
87/07/22	19:03:48.0	053	78260	74560	4.96
87/07/22	19:04:35.8	063	34400	27960	23.03
87/07/22	19:15:37.0	053	76041	75280	1.01
87/07/22	19:20:27.0	057	74550	78340	-4.84
87/07/22	19:20:33.9	060	44304	48220	-8.12
87/07/22	19:30:19.0	055	92655	78560	17.94
87/07/22	19:50:50.0	057	44091	51940	-15.11
87/07/22	19:55:19.1	048	92655	79360	16.75
87/07/22	19:55:23.9	042	86052	78680	9.37
87/07/22	20:15:24.0	057	29394	25920	13.40
87/08/19	08:52:39.0	036	89655	78600	14.06

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/08/19	08:53:17.7	060	91164	101700	-10.36
87/08/19	09:17:55.0	045	83635	81000	3.25
87/08/19	09:22:28.3	066	39990	38160	4.80
87/08/19	09:37:51.6	063	37674	40820	-7.71
87/08/19	09:52:45.1	044	72885	77820	-6.34
87/08/19	10:15:51.0	060	28080	28060	0.07
87/08/19	10:47:48.0	050	27903	29260	-4.64
87/08/19	10:53:41.2	051	42785	48240	-11.31
87/08/19	11:41:20.0	050	71136	78880	-9.82
87/08/19	11:49:05.0	053	90951	79660	14.17
87/08/19	12:04:33.0	057	29820	31560	-5.51
87/08/19	12:28:31.2	050	83205	80160	3.80
87/08/19	12:41:33.0	047	81579	72140	13.08
87/08/19	13:00:23.0	053	33867	30420	11.33
87/08/19	13:05:59.1	048	70950	74820	-5.17
87/08/19	13:23:46.4	049	29025	37800	-23.21
87/08/19	13:28:47.0	056	61983	59840	3.58
87/08/19	14:20:20.0	062	43239	41300	4.69
87/08/19	14:25:55.1	048	71810	80300	-10.57
87/08/19	14:28:53.4	047	76970	79120	-2.72
87/08/19	14:38:20.0	042	23856	30420	-21.58
87/08/19	14:38:47.0	044	32250	39220	-17.77
87/08/19	14:41:08.0	056	79550	84460	-5.81
87/08/19	14:51:55.0	044	50955	55260	-7.79
87/08/19	15:57:09.0	049	67080	73500	-8.73
87/08/19	16:24:33.0	057	31737	32020	-0.88
87/08/19	17:23:31.0	055	77830	78780	-1.21
87/08/19	17:29:16.0	039	82560	79120	4.35
87/08/19	17:40:15.0	049	80410	79700	0.89
87/08/21	10:40:49.0	057	96642	78280	23.46
87/08/21	10:55:55.3	050	88452	79000	11.96
87/08/21	10:56:59.2	054	95238	76500	24.49
87/08/21	11:25:01.0	063	41418	28880	43.41
87/08/21	12:13:56.0	073	82836	73420	12.82
87/08/21	12:43:48.7	063	47268	40500	16.71
87/08/21	12:49:50.0	071	36972	31040	19.11
87/08/21	12:56:09.1	056	36738	34180	7.48
87/08/21	13:23:18.0	068	106704	78720	35.55
87/08/21	13:51:12.0	062	88218	77840	13.33
87/08/21	14:23:50.2	056	74178	74520	-0.46
87/08/21	14:25:20.0	062	80730	79100	2.06
87/08/21	15:10:25.2	058	107640	79460	35.46
87/08/21	15:35:47.9	062	37674	33200	13.48
87/08/21	19:34:03.8	056	112086	78020	43.66
87/08/21	19:34:09.4	056	83070	79060	5.07
87/08/21	20:01:55.0	063	99918	78900	26.64

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/08/21	20:02:49.8	055	96642	75440	28.10
87/08/21	20:22:13.5	063	75582	79480	-4.90
87/08/21	21:00:35.0	062	78156	79120	-1.22
87/08/21	21:13:36.6	056	105300	78340	34.41
87/08/21	21:55:40.6	060	91962	76980	19.46
87/08/22	01:13:57.0	063	39078	31220	25.17
87/08/22	02:13:11.2	060	117936	100920	16.86
87/08/22	02:42:16.1	062	94770	78120	21.31
87/08/24	09:36:56.0	063	93834	76940	21.96
87/08/24	10:05:44.5	067	93834	78180	20.02
87/08/24	10:57:34.0	065	91260	65800	38.69
87/08/24	11:08:04.6	058	92898	76810	20.95
87/09/02	17:48:33.7	058	44496	44540	-0.10
87/09/02	18:06:11.0	050	49646	47480	4.56
87/09/02	18:11:48.5	056	73748	75680	-2.55
87/09/02	18:14:29.0	058	74572	74480	0.12
87/09/02	18:20:05.0	065	77868	76820	1.36
87/09/02	18:22:38.9	058	87344	79780	9.48
87/09/02	18:30:13.0	066	81370	79320	2.58
87/09/02	18:30:23.0	063	30076	32740	-8.14
87/09/02	18:34:51.5	065	69628	78780	-11.62
87/09/02	18:46:27.5	058	58504	33320	75.58
87/09/02	18:47:15.0	056	25544	32520	-21.45
87/09/02	19:02:11.0	060	94966	73500	29.21
87/09/02	19:06:23.0	062	77456	70980	9.12
87/09/02	19:07:05.0	053	78692	74920	5.03
87/09/02	19:09:23.7	065	74984	79360	-5.51
87/09/02	19:09:50.7	062	82400	78680	4.73
87/09/02	19:12:16.0	060	46968	37540	25.11
87/09/02	19:12:51.2	051	69216	60580	14.26
87/09/02	19:17:13.0	055	46762	40280	16.09
87/09/02	19:19:02.0	065	39346	66400	-40.74
87/09/02	19:21:19.0	056	54384	56800	-4.25
87/09/02	19:24:49.0	064	62212	71260	-12.70
87/09/02	19:30:14.4	058	79104	74400	6.32
87/09/02	19:32:19.0	054	71482	71200	0.40
87/09/02	19:32:23.4	061	70658	74700	-5.41
87/09/02	19:35:37.0	057	48616	46620	4.28
87/09/02	19:37:18.4	059	26368	29920	-11.87
87/09/02	19:39:28.5	063	27192	27860	-2.40
87/09/02	19:44:13.4	055	51294	47220	8.63
87/09/02	19:58:35.5	062	45114	62600	-27.93
87/09/02	20:01:23.0	056	86726	67360	28.75
87/09/02	20:01:58.0	048	25544	44060	-42.02
87/09/02	20:18:16.5	054	78074	78060	0.02
87/09/02	20:20:33.0	058	52530	71540	-26.57

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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/02	20:23:54.0	050	45114	57100	-20.99
87/09/02	20:33:23.0	061	74366	73740	0.85
87/09/02	20:38:00.8	056	38728	36200	6.98
87/09/02	20:55:09.6	063	80546	71300	12.97
87/09/02	20:59:18.3	052	87962	72980	20.53
87/09/02	21:02:58.0	059	45732	46400	-1.44
87/09/02	21:04:48.0	063	70452	63460	11.02
87/09/02	21:08:17.0	059	32548	48740	-33.22
87/09/02	21:11:28.8	067	80134	78380	2.24
87/09/04	05:50:38.0	053	88686	75040	18.18
87/09/04	05:57:07.7	060	79092	73540	7.55
87/09/04	06:31:55.0	062	32960	37940	-13.13
87/09/04	06:33:39.1	065	46762	42580	9.82
87/09/04	07:19:47.3	065	68598	65840	4.19
87/09/04	09:09:36.0	042	83772	77700	7.81
87/09/04	09:12:51.8	064	77688	69180	12.30
87/09/04	09:15:51.0	055	51912	53060	-2.16
87/09/04	09:21:11.0	051	104130	75960	37.09
87/09/04	09:27:57.0	070	32960	39840	-17.27
87/09/04	09:28:30.8	062	77868	79160	-1.63
87/09/04	09:29:03.6	062	24308	28660	-15.18
87/09/04	09:33:52.0	066	47998	44920	6.85
87/09/04	09:34:28.0	063	49234	51720	-4.81
87/09/04	09:40:08.0	050	48438	36780	31.70
87/09/04	09:40:16.1	065	85410	68180	25.27
87/09/04	09:41:45.5	060	45864	42840	7.06
87/09/04	09:42:12.9	060	101322	76600	32.27
87/09/04	09:43:14.4	068	80496	73580	9.40
87/09/04	09:46:33.2	066	85490	76300	12.04
87/09/04	09:51:31.0	046	88920	66200	34.32
87/09/04	09:51:42.3	047	86346	76040	13.55
87/09/04	09:54:24.7	058	83304	73380	13.52
87/09/04	09:59:16.7	058	96876	74520	30.00
87/09/04	10:09:57.1	052	81900	73800	10.98
87/09/04	10:12:19.4	055	92196	79220	16.38
87/09/04	10:16:31.0	060	45938	49000	-6.25
87/09/04	10:17:16.0	052	78486	70600	11.17
87/09/04	10:17:50.1	057	69216	74680	-7.32
87/09/04	10:20:12.0	060	90792	76680	18.40
87/09/04	10:22:38.7	066	90324	78460	15.12
87/09/04	10:27:46.0	065	84006	62820	33.72
87/09/04	10:28:28.3	061	82602	73740	12.02
87/09/04	10:35:39.0	055	96408	74320	29.72
87/09/04	10:38:23.8	052	98280	77000	27.64
87/09/04	10:39:51.0	056	90792	77460	17.21
87/09/04	10:55:48.0	057	75190	77020	-2.38

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/04	10:55:52.3	053	33578	37840	-11.26
87/09/04	11:03:33.5	071	82836	71660	15.60
87/09/04	11:08:09.7	056	88218	80020	10.24
87/09/04	11:10:37.6	062	79326	76620	3.53
87/09/04	11:10:41.4	059	89154	78640	13.37
87/09/04	11:12:49.1	061	102492	80100	27.96
87/09/04	11:13:03.0	050	86580	78040	10.94
87/09/04	11:20:06.4	065	85878	75920	13.12
87/09/04	11:25:22.3	064	64584	50180	28.70
87/09/04	11:27:25.9	053	87750	79240	10.74
87/09/04	11:29:02.6	037	57330	56220	1.97
87/09/04	11:29:55.7	044	87048	77000	13.05
87/09/04	11:36:23.7	056	103428	76600	35.02
87/09/04	11:37:32.0	055	85410	61460	38.97
87/09/04	11:46:06.7	055	59202	55480	6.71
87/09/04	11:49:09.9	053	86112	68120	26.41
87/09/04	11:53:31.0	054	79092	75420	4.87
87/09/04	11:54:33.9	052	89388	79120	12.98
87/09/04	11:54:37.5	048	73008	77400	-5.67
87/09/04	11:55:42.7	057	77868	74520	4.49
87/09/04	11:56:47.2	052	59436	57840	2.76
87/09/04	11:57:52.7	035	86346	74840	15.37
87/09/04	12:02:16.8	055	93132	77640	19.95
87/09/04	12:36:06.7	055	77454	75900	2.05
87/09/04	12:40:21.0	067	80730	78100	3.37
87/09/04	12:54:06.4	063	83070	78960	5.21
87/09/04	12:59:04.6	072	86346	78520	9.97
87/09/04	12:59:19.0	063	84942	64480	31.73
87/09/04	12:59:49.0	057	88452	75540	17.09
87/09/10	11:57:50.2	053	38485	45860	-16.08
87/09/10	11:58:43.2	042	58265	71180	-18.14
87/09/10	12:00:14.2	053	41280	44600	-7.44
87/09/10	12:06:38.0	048	70305	71200	-1.26
87/09/10	12:07:37.3	047	79335	78160	1.50
87/09/10	12:08:03.0	037	88365	79620	10.98
87/09/10	12:16:46.9	050	74820	76800	-2.58
87/09/10	12:16:59.0	043	31175	37780	-17.48
87/09/10	12:24:06.8	036	72670	72880	-0.29
87/09/10	12:25:19.5	058	33110	37260	-11.14
87/09/10	12:33:53.6	053	54610	58500	-6.65
87/09/10	12:34:55.0	058	37840	44470	-14.91
87/09/10	12:36:37.4	056	35260	43920	-19.72
87/09/10	12:37:44.0	050	70520	75220	-6.25
87/09/10	12:38:31.8	050	39560	44940	-11.97
87/09/10	13:00:34.0	053	64285	76980	-16.49
87/09/10	13:02:39.0	048	76540	78740	-2.79

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/10	13:03:08.3	045	30315	34780	-12.84
87/09/10	13:06:54.7	052	39775	49940	-20.35
87/09/10	13:07:31.0	043	74605	79880	-6.60
87/09/10	13:08:55.1	049	32680	28540	14.51
87/09/10	13:39:34.0	050	56115	76420	-26.57
87/09/10	13:57:24.2	062	33325	29440	13.20
87/09/10	13:59:52.0	064	66865	72920	-8.30
87/09/10	14:01:35.0	063	29240	35200	-16.93
87/09/10	14:05:01.0	057	33755	39140	-13.76
87/09/10	14:05:38.0	063	75250	68660	9.60
87/09/10	14:05:42.4	066	81915	75440	8.58
87/09/12	07:32:07.7	063	72240	47600	51.76
87/09/12	08:04:50.0	051	86215	79600	8.31
87/09/12	08:17:52.0	065	116315	77000	51.06
87/09/12	08:20:15.0	069	83420	68100	22.50
87/09/12	08:43:34.7	056	27090	50700	-46.57
87/09/12	09:05:05.0	056	103630	79000	31.18
87/09/12	09:05:09.4	055	87075	76200	14.27
87/09/12	09:09:34.0	063	96105	77300	24.33
87/09/12	09:09:51.2	057	89655	62800	42.76
87/09/12	09:13:12.2	062	91375	60000	52.29
87/09/12	09:24:27.0	067	76110	58400	30.33
87/09/12	09:27:04.5	067	60845	51700	17.69
87/09/12	09:37:07.6	052	87505	79300	10.35
87/09/12	09:37:34.0	059	64285	48300	33.10
87/09/12	09:52:52.2	058	87720	66700	31.51
87/09/12	10:03:58.0	057	53965	49700	8.58
87/09/12	10:07:52.5	045	100835	80800	24.80
87/09/12	10:09:17.0	060	62350	49700	25.45
87/09/12	10:13:14.6	057	82130	67000	22.58
87/09/12	10:16:53.7	054	92235	79200	16.46
87/09/12	10:21:07.8	064	69445	51700	34.32
87/09/12	10:31:06.0	063	86645	55400	56.40
87/09/12	10:43:07.6	057	97180	75800	28.21
87/09/12	10:44:19.9	067	38700	32200	20.19
87/09/12	10:51:49.0	057	87935	76500	14.95
87/09/12	10:54:20.0	060	102985	76800	34.10
87/09/12	11:06:15.0	051	86000	77400	11.11
87/09/12	11:08:19.0	064	73745	60100	22.70
87/09/12	11:18:07.7	062	62350	57400	8.62
87/09/12	11:18:18.9	045	71810	76800	-6.50
87/09/12	11:20:45.0	055	87290	80100	8.98
87/09/12	11:21:57.0	048	83420	80000	4.28
87/09/12	11:28:06.8	051	51600	49900	3.41
87/09/12	11:32:57.1	060	97825	79800	22.59
87/09/12	11:38:22.7	057	87505	74900	16.83

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/12	11:49:56.0	047	72240	83800	-13.79
87/09/12	11:59:03.0	063	93310	73600	26.78
87/09/12	12:02:12.0	054	66220	70500	-6.07
87/09/12	12:02:38.1	057	71165	75900	-6.24
87/09/12	12:08:47.0	065	85570	74800	14.40
87/09/12	12:12:30.3	063	78690	72400	8.69
87/09/12	12:17:35.7	060	77400	78500	-1.40
87/09/12	12:21:08.0	065	92020	78500	17.22
87/09/12	12:21:31.0	062	84280	76800	9.74
87/09/12	12:31:02.0	056	36120	32000	12.88
87/09/12	12:36:25.0	072	45150	56700	-20.37
87/09/12	12:40:12.4	059	79765	77500	2.92
87/09/12	12:41:40.1	062	69875	78000	-10.42
87/09/12	12:42:19.0	056	53535	54900	-2.49
87/09/12	12:52:16.3	062	30745	33700	-8.77
87/09/12	12:54:25.3	058	77615	71400	8.70
87/09/12	12:54:30.4	062	39990	42900	-6.78
87/09/12	12:55:42.1	061	48805	44900	8.70
87/09/12	13:00:42.4	053	73745	79600	-7.36
87/09/12	13:10:43.3	056	78905	76200	3.55
87/09/12	13:12:47.5	060	95460	77100	23.81
87/09/12	13:14:42.5	064	48375	52700	-8.21
87/09/12	13:23:59.3	058	55255	61400	-10.01
87/09/12	13:29:06.0	062	42570	43900	-3.03
87/09/12	13:34:58.0	057	65790	63300	3.93
87/09/12	13:39:06.0	060	85140	74600	14.13
87/09/12	13:43:22.4	052	84280	75400	11.78
87/09/12	13:48:46.0	051	62995	68500	-8.04
87/09/12	14:09:31.1	062	74605	74800	-0.26
87/09/12	14:13:56.0	056	83850	78100	7.36
87/09/12	14:22:50.1	058	67510	79600	-15.19
87/09/12	14:25:08.2	057	78475	78400	0.10
87/09/12	14:32:02.0	063	42140	51100	-17.53
87/09/12	14:36:00.7	078	70090	73700	-4.90
87/09/12	14:42:06.0	062	70950	77800	-8.80
87/09/12	14:42:15.0	063	73315	78100	-6.13
87/09/12	14:43:48.8	066	85570	78400	9.15
87/09/12	14:44:40.3	058	74605	75300	-0.92
87/09/18	09:35:08.6	056	52722	55900	-5.69
87/09/18	10:02:02.0	057	56156	55760	0.71
87/09/18	10:02:31.0	063	77568	78740	-1.49
87/09/18	10:02:52.0	068	50702	44600	13.68
87/09/18	10:08:09.8	058	71710	67400	6.39
87/09/18	10:28:03.0	060	87668	77220	13.53
87/09/18	10:32:52.0	063	95142	79080	20.31
87/09/18	10:40:34.8	062	64034	56080	14.18

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/18	11:22:16.6	060	36562	33340	9.66
87/09/18	11:22:25.0	058	81810	66920	22.25
87/09/18	11:44:15.0	063	90698	87920	3.16
87/09/18	11:47:05.2	060	29694	27260	8.93
87/09/18	11:53:16.7	064	34744	34220	1.53
87/09/18	12:00:30.0	057	74740	75420	-0.90
87/09/18	12:01:10.0	055	68680	73600	-6.68
87/09/18	12:44:58.0	062	64438	60320	6.83
87/09/18	12:45:22.0	063	75750	68660	10.33
87/09/18	12:46:27.8	058	69286	71360	-2.91
87/09/18	12:56:29.0	063	89284	77620	15.03
87/09/18	12:59:25.0	071	83022	75760	9.59
87/09/18	13:17:22.0	056	89486	73520	21.72
87/09/18	13:24:59.0	050	72922	55300	31.87
87/09/18	13:42:42.6	068	78376	67860	15.50
87/09/18	13:54:12.6	068	79588	74320	7.09
87/09/18	14:01:01.5	060	33734	30100	12.07
87/09/19	10:13:02.0	060	84840	77340	9.70
87/09/19	10:16:19.4	062	89688	76900	16.63
87/09/19	10:24:53.4	056	78376	72620	7.93
87/09/19	10:27:02.8	060	36158	37620	-3.89
87/09/19	10:30:04.0	066	66862	55520	20.43
87/09/19	10:32:59.5	064	41410	44380	-6.69
87/09/19	10:36:21.0	066	96556	76540	26.15
87/09/19	10:42:38.8	052	89688	77840	15.22
87/09/19	10:53:32.7	070	86052	74240	15.91
87/09/19	11:09:31.4	063	87264	78820	10.71
87/09/19	11:12:44.3	065	80194	76420	4.94
87/09/19	11:18:06.4	065	92112	79520	15.84
87/09/19	11:18:14.0	058	92112	80260	14.77
87/09/19	11:26:27.5	058	85244	71580	19.09
87/09/19	11:27:23.4	057	80194	71120	12.76
87/09/19	11:28:46.8	066	80194	78420	2.26
87/09/19	11:47:23.0	065	59994	60080	-0.14
87/09/19	11:51:32.1	024	83022	79440	4.51
87/09/19	12:04:44.0	066	77568	73300	5.82
87/09/19	12:22:39.5	064	55954	60120	-6.93
87/09/19	12:23:22.7	063	74336	63880	16.37
87/09/19	12:24:57.5	064	84436	75800	11.39
87/09/19	12:31:19.9	065	43026	46660	-7.79
87/09/19	12:32:45.2	063	84840	74500	13.88
87/09/19	12:40:55.0	066	42218	45160	-6.51
87/09/19	12:50:27.0	066	69488	71160	-2.35
87/09/19	12:53:42.3	057	84032	76080	10.45
87/09/19	12:56:55.1	067	68680	65820	4.35
87/09/19	13:03:29.0	058	82012	77980	5.17

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
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NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/19	13:17:22.1	068	64236	79020	-18.71
87/09/19	13:18:11.0	053	72316	65360	10.64
87/09/19	13:21:34.1	062	82618	78120	5.76
87/09/19	13:34:16.0	062	82214	74040	11.04
87/09/19	13:42:40.0	044	84032	75340	11.54
87/09/19	13:51:24.1	063	85042	78220	8.72
87/09/19	13:54:03.0	053	81810	73160	11.82
87/09/19	14:00:20.8	059	82416	78500	4.99
87/09/29	11:09:27.3	028	77745	76900	1.10
87/09/29	11:12:41.0	014	33228	48020	-30.80
87/09/29	11:39:52.5	035	69864	59480	17.46
87/09/29	11:42:06.3	046	80514	65700	22.55
87/09/29	11:54:33.0	044	87969	75740	16.15
87/09/29	12:03:51.8	048	85839	77560	10.67
87/09/29	12:06:41.2	054	83628	77740	7.57
87/09/29	12:09:28.5	055	85042	78540	8.28
87/09/29	12:11:16.4	064	43632	42660	2.28
87/09/29	12:24:06.8	060	31108	30720	1.26
87/09/29	12:29:48.2	055	83224	75460	10.29
87/09/29	12:36:12.8	048	82431	77320	6.61
87/09/29	12:36:14.6	052	73124	68260	7.13
87/09/29	12:42:35.5	062	26664	28900	-7.74
87/09/29	13:16:23.2	056	31108	31200	-0.29
87/09/29	13:24:01.3	053	83022	73180	13.45
87/09/29	13:25:28.0	048	82431	76580	7.64
87/09/29	13:42:51.3	065	25048	28120	-10.92
87/09/29	13:50:38.0	052	89890	78120	15.07
87/09/29	13:57:58.0	044	29394	30080	-2.28
87/09/29	14:04:18.0	069	35148	32860	6.96
87/09/29	14:04:23.2	064	33330	32420	2.81
87/09/29	14:04:34.3	065	25048	30980	-19.15
87/09/29	14:12:20.8	063	27876	28580	-2.46
87/09/29	14:12:27.0	070	27472	29640	-7.31
87/09/29	14:13:14.0	058	28755	29200	-1.52
87/09/29	14:19:47.0	039	67095	73380	-8.57
87/09/29	14:21:11.0	051	84561	76920	9.93
87/09/29	14:28:01.0	052	99045	77940	27.08
87/09/29	14:30:20.3	046	69651	61900	12.52
87/09/29	14:35:10.3	067	31311	32560	-3.84
87/09/29	14:47:20.7	063	76760	69000	11.25
87/09/29	14:48:52.2	066	30300	33080	-8.40
87/09/29	14:49:33.3	053	75189	76220	-1.35
87/09/29	15:04:18.0	048	76893	72720	5.74
87/09/29	15:04:34.0	052	80727	77720	3.87
87/09/29	15:06:47.2	065	25048	29500	-15.09
87/09/29	15:08:54.6	063	34340	30760	11.64

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/29	15:09:02.0	062	27876	30140	-7.51
87/09/29	15:10:01.0	054	72633	78600	-7.59
87/09/29	15:16:20.6	062	30033	56580	-46.92
87/09/29	15:34:49.9	055	92920	79800	16.44
87/09/29	15:41:51.0	066	32118	30880	4.01
87/09/29	15:42:59.9	054	81608	74540	9.48
87/09/29	15:44:37.0	053	78597	73740	6.59
87/09/29	15:46:18.4	045	78810	79260	-0.57
87/09/29	15:59:16.6	049	84561	79600	6.23
87/09/29	16:00:52.7	063	35350	40040	-11.71
87/09/29	16:11:46.0	052	71355	74200	-3.83
87/09/29	16:15:13.6	053	87668	78620	11.51
87/09/29	16:18:01.0	056	76558	73640	3.96
87/09/29	16:39:19.0	052	30502	28320	7.70
87/09/29	16:40:46.0	045	91164	73220	24.51
87/09/29	16:43:45.0	053	51712	45900	12.66
87/09/29	16:51:13.5	066	17170	31720	-45.87
87/09/29	16:53:22.3	047	84987	76960	10.43
87/09/29	17:08:30.3	052	89890	77460	16.05
87/09/29	17:08:37.4	057	92112	79600	15.72
87/09/29	17:08:57.0	063	29820	29560	0.88
87/09/29	17:14:45.7	052	31916	28920	10.36
87/09/29	17:16:02.1	052	98778	77320	27.75
87/09/29	17:23:59.5	047	84348	79480	6.12
87/09/29	17:27:33.4	053	48777	51980	-6.16
87/09/29	17:34:32.0	048	81366	75500	7.77
87/09/29	17:36:20.0	048	78384	74880	4.68
87/09/29	17:39:13.0	052	80514	77960	3.28
87/09/29	17:42:58.2	058	94132	77860	20.90
87/09/29	17:44:22.8	052	90312	71680	25.99
87/09/29	17:55:23.0	062	38986	39520	-1.35
87/09/29	17:56:44.6	057	90698	76280	18.90
87/09/29	17:57:17.2	054	47672	49440	-3.58
87/09/29	17:58:48.5	048	35956	29360	22.47
87/09/29	18:00:34.0	060	32522	30140	7.90
87/09/29	18:07:20.0	063	78376	65780	19.15
87/09/29	18:12:28.0	062	90900	78180	16.27
87/09/29	18:15:32.0	058	77366	73940	4.63
87/09/29	18:18:13.7	038	83496	76740	8.80
87/09/29	18:23:20.7	053	86052	78040	10.27
87/09/29	18:33:04.0	046	81153	78440	3.46
87/09/29	18:33:45.0	056	88182	74880	17.76
87/09/29	18:37:50.2	050	76893	78820	-2.44
87/09/29	18:39:20.0	053	87117	79280	9.89
87/09/29	18:46:33.6	072	87668	78200	12.11
87/09/29	18:56:47.7	046	83070	79220	4.86

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/29	18:57:00.0	043	93081	78880	18.00
87/09/29	18:57:09.0	043	97341	79260	22.81
87/09/29	18:58:19.9	048	88608	79860	10.95
87/09/29	19:02:15.8	058	37062	32620	13.62
87/09/29	19:04:59.7	048	88072	77400	13.79
87/09/29	19:09:44.4	065	37701	30620	23.13
87/09/29	19:11:12.0	055	79023	73240	7.90
87/09/29	19:28:45.7	047	36966	30800	20.02
87/09/29	19:31:40.9	052	39592	31300	26.49
87/09/29	19:38:01.8	061	84840	77700	9.19
87/09/29	19:40:11.8	056	71781	79360	-9.55
87/09/29	19:43:43.0	058	26625	29980	-11.19
87/09/29	19:45:21.0	062	31310	30000	4.37
87/09/29	19:45:33.0	062	25856	30780	-16.00
87/09/29	19:52:51.6	060	35571	33660	5.68
87/09/29	20:02:12.0	055	26838	26780	0.22
87/09/29	20:02:41.8	053	81810	78700	3.95
87/09/29	20:06:10.9	037	78597	79800	-1.51
87/09/29	20:07:34.0	047	88182	82480	6.91
87/09/29	20:10:33.3	051	90092	76940	17.09
87/09/29	20:11:43.8	043	81579	78080	4.48
87/09/29	20:14:05.8	049	89673	78700	13.94
87/09/29	20:21:58.3	057	58575	51120	14.58
87/09/29	20:33:02.2	055	31310	29540	5.99
87/09/29	20:35:33.2	068	85850	79040	8.62
87/09/29	20:47:27.0	052	47499	54160	-12.30
87/09/29	20:50:33.1	055	31916	29020	9.98
87/09/29	20:50:57.0	059	12726	30340	-58.06
87/09/29	20:51:44.4	056	88274	78440	12.54
87/09/29	20:51:48.4	053	31714	30600	3.64
87/09/29	20:51:57.0	040	63474	68100	-6.79
87/09/29	20:52:06.9	046	99258	80600	23.15
87/09/29	21:03:57.0	076	22018	30140	-26.95
87/09/29	21:14:35.0	043	80514	78100	3.09
87/09/29	21:23:13.4	039	82644	77360	6.83
87/09/29	21:24:21.3	040	89082	67360	32.25
87/09/29	21:31:42.0	050	97566	73400	32.92
87/09/29	21:34:09.3	065	35552	30920	14.98
87/09/29	21:39:58.0	044	86265	77360	11.51
87/09/29	21:40:03.4	043	86265	79000	9.20
87/09/29	21:40:28.4	052	97980	78460	24.88
87/09/29	21:40:45.4	055	89890	78580	14.39
87/09/29	21:51:28.0	040	89890	76580	17.38
87/09/29	21:54:16.0	042	99471	78740	26.33
87/09/29	21:58:11.4	045	86691	77260	12.21
87/09/29	22:01:21.3	042	40896	48080	-14.94

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/29	22:11:16.0	048	95850	79360	20.78
87/09/30	06:31:24.3	047	80088	79080	1.27
87/09/30	07:02:43.0	062	116150	79320	46.43
87/09/30	07:10:22.4	046	79875	79780	0.12
87/09/30	07:33:40.0	047	87756	78760	11.42
87/09/30	07:39:24.0	057	33532	29740	12.75
87/09/30	07:39:45.6	066	19392	30260	-35.92
87/09/30	07:39:58.0	063	96354	79220	21.63
87/09/30	07:40:03.0	062	34138	29280	16.59
87/09/30	07:47:39.0	052	29394	29440	-0.16
87/09/30	07:49:37.2	063	80800	61120	32.20
87/09/30	07:49:40.4	055	96960	76440	26.84
87/09/30	08:10:23.0	061	75346	67440	11.72
87/09/30	08:25:13.0	048	81153	78460	3.43
87/09/30	08:26:25.3	048	78597	76200	3.15
87/09/30	08:36:35.0	068	62014	78600	-21.10
87/09/30	08:43:39.0	052	89886	76940	16.83
87/09/30	08:52:21.2	048	96276	79080	21.75
87/09/30	08:54:01.5	066	36158	30300	19.33
87/09/30	09:13:30.0	055	71104	59900	18.70
87/09/30	09:19:01.0	053	104434	77240	35.21
87/09/30	09:22:07.4	045	76893	71520	7.51
87/09/30	09:22:31.9	047	90099	72300	24.62
87/09/30	09:23:24.0	047	86052	76660	12.25
87/09/30	09:26:16.6	048	60705	52100	16.52
87/09/30	09:27:49.7	049	62409	62740	-0.53
87/09/30	09:28:59.0	056	86658	75960	14.08
87/09/30	09:38:53.0	062	56762	51640	9.92
87/09/30	09:46:54.8	052	88476	75420	17.31
87/09/30	09:49:01.6	055	75144	49800	50.89
87/09/30	09:59:17.7	047	92112	78760	16.95
87/09/30	10:00:16.6	052	100596	77800	29.30
87/09/30	10:10:28.2	045	75828	75980	-0.20
87/09/30	10:17:58.0	050	98374	77620	26.74
87/09/30	10:22:41.0	057	63226	49180	28.56
87/09/30	10:25:54.4	067	29492	29460	0.11
87/09/30	10:28:57.6	066	34946	29680	17.74
87/09/30	10:29:00.3	067	34138	40420	-15.54
87/09/30	10:30:11.6	067	25856	25480	1.48
87/09/30	10:36:00.2	048	86052	79240	8.60
87/09/30	10:38:43.4	048	92229	78400	17.64
87/09/30	10:41:50.0	050	84987	78160	8.73
87/09/30	10:41:59.0	047	83496	79140	5.50
87/09/30	10:44:31.7	045	78384	80540	-2.68
87/09/30	10:48:59.7	053	86052	72940	17.98
87/09/30	10:50:49.2	037	53889	55400	-2.73

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/30	10:52:05.0	063	45652	43590	4.73
87/09/30	10:56:56.0	035	54954	56080	-2.01
87/09/30	10:58:45.6	043	78384	79500	-1.40
87/09/30	11:07:52.0	066	52924	38040	39.13
87/09/30	11:13:04.6	061	84638	73680	14.87
87/09/30	11:22:26.3	040	86691	79420	9.16
87/09/30	11:25:49.0	045	96915	79460	21.97
87/09/30	11:26:04.6	045	90951	78100	16.45
87/09/30	11:26:09.3	047	59001	53500	10.28
87/09/30	11:30:01.3	062	33441	29400	13.74
87/09/30	11:31:26.0	052	81366	79240	2.68
87/09/30	11:31:38.0	066	31737	30580	3.78
87/09/30	11:41:59.0	050	88821	76140	16.65
87/09/30	11:47:36.0	050	53037	49800	6.50
87/09/30	11:51:14.0	062	25856	30640	-15.61
87/09/30	11:56:09.2	061	48884	41680	17.28
87/09/30	12:00:04.5	047	82005	79640	2.97
87/09/30	12:09:05.8	049	93933	78360	19.87
87/09/30	12:15:14.5	075	85850	78780	8.97
87/09/30	12:17:14.0	041	81579	79440	2.69
87/09/30	12:18:20.0	045	93081	81720	13.90
87/09/30	12:23:17.6	061	39188	34220	14.52
87/09/30	12:25:54.0	055	33330	33060	0.82
87/09/30	12:29:03.0	050	84987	79020	7.55
87/09/30	12:39:27.6	052	66256	55760	18.82
87/09/30	12:39:39.0	043	89247	78720	13.37
87/09/30	12:39:44.0	060	66660	52220	27.65
87/09/30	12:40:01.0	047	66256	53480	23.89
87/09/30	12:40:09.0	059	70700	49920	41.63
87/09/30	12:40:31.8	050	57084	52180	9.40
87/09/30	12:49:56.2	060	46864	39160	19.67
87/09/30	12:58:38.0	045	72420	72980	-0.77
87/09/30	13:08:53.0	047	62196	75360	-17.47
87/09/30	13:17:27.1	049	54741	45720	19.73
87/09/30	13:21:35.5	060	94536	78320	20.70
87/09/30	13:24:14.0	059	91304	76520	19.32
87/09/30	13:30:06.3	053	70503	62620	12.59
87/09/30	13:31:17.1	048	78384	78240	0.18
87/09/30	13:32:41.0	052	75402	78620	-4.09
87/09/30	13:42:10.4	043	76893	76600	0.38
87/09/30	13:43:04.0	045	93720	78900	18.78
87/09/30	13:45:31.0	045	86691	79260	9.38
87/09/30	13:46:16.0	053	54315	51580	5.30
87/09/30	13:53:19.6	065	25986	28220	-7.92
87/09/30	13:57:20.0	072	32522	29040	11.99
87/09/30	14:00:16.0	050	33936	29240	16.06

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/30	14:01:04.0	053	67308	59920	12.33
87/09/30	14:03:55.0	067	24708	30620	-19.31
87/09/30	14:10:17.0	054	38178	35300	8.15
87/09/30	14:21:34.0	041	73698	77260	-4.61
87/09/30	14:25:57.0	058	52722	52340	0.73
87/09/30	14:32:44.3	042	81002	71998	12.51
87/09/30	14:36:24.4	046	61770	64860	-4.76
87/09/30	14:39:00.5	055	30300	29480	2.78
87/09/30	14:44:24.3	045	84774	78120	8.52
87/09/30	15:05:28.0	060	37062	35500	4.40
87/09/30	15:05:45.0	058	32376	33540	-3.47
87/09/30	15:06:26.8	052	43026	50780	-15.27
87/09/30	15:18:27.0	083	18988	43460	-56.31
87/09/30	15:29:38.0	062	24442	26560	-7.97
87/09/30	15:29:51.0	062	83224	75580	10.11
87/09/30	15:37:57.0	058	99258	71420	38.98
87/09/30	15:52:24.0	059	65604	66820	-1.82
87/09/30	15:53:17.0	054	78376	73320	6.90
87/09/30	15:55:32.9	058	88274	66500	32.74
87/09/30	15:55:41.0	053	72922	67480	8.06
87/09/30	15:56:42.0	046	81579	76740	6.31
87/09/30	15:59:34.8	037	84348	77200	9.26
87/09/30	16:00:53.0	045	90312	78940	14.41
87/09/30	16:01:35.0	060	36423	31220	16.67
87/09/30	16:02:55.2	043	72114	67480	6.87
87/09/30	16:03:21.0	045	81366	78260	3.97
87/09/30	16:04:22.0	050	80088	78060	2.60
87/09/30	16:04:56.7	048	77745	75980	2.32
87/09/30	16:13:42.0	049	77319	78600	-1.63
87/09/30	16:13:55.1	048	78810	76840	2.56
87/09/30	16:19:12.0	045	104583	77420	35.09
87/09/30	16:25:58.9	063	41535	30280	37.17
87/09/30	16:26:45.0	049	83283	79320	5.00
87/09/30	16:35:58.1	055	66256	61560	7.63
87/09/30	16:40:43.8	046	92655	78280	18.36
87/09/30	16:51:33.0	055	29088	27820	4.56
87/09/30	17:01:33.0	059	29694	30080	-1.28
87/09/30	17:17:50.0	059	75144	78280	-4.01
87/09/30	17:23:34.0	068	29694	30100	-1.35
87/09/30	17:23:56.4	050	83496	78280	6.66
87/09/30	17:29:40.0	063	34946	28640	22.02
87/09/30	17:31:12.5	064	95950	79760	20.30
87/09/30	17:31:36.0	063	96152	74740	28.65
87/09/30	17:32:52.8	057	55380	51340	7.87
87/09/30	17:40:13.0	060	69084	59780	15.56
87/09/30	17:42:48.1	048	82857	77700	6.64

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/09/30	17:44:10.3	059	25452	38380	-33.68
87/09/30	17:45:23.0	061	70902	50260	41.07
87/09/30	17:47:23.0	046	94146	79300	18.72
87/09/30	17:53:11.9	053	30672	28400	8.00
87/09/30	17:53:43.0	066	34542	31600	9.31
87/09/30	17:55:08.0	062	37572	31040	21.04
87/09/30	19:14:02.4	046	76893	78520	-2.07
87/10/02	12:22:01.6	069	53126	55280	-3.90
87/10/02	12:33:50.6	056	29896	33100	-9.68
87/10/02	12:40:58.0	061	74336	68020	9.29
87/10/02	12:47:42.0	060	40602	64480	-37.03
87/10/02	12:51:01.4	052	27674	30240	-8.49
87/10/02	13:01:00.5	061	56964	59940	-4.96
87/10/02	13:03:48.4	052	29290	38140	-23.20
87/10/02	13:21:22.8	058	78578	76120	3.23
87/10/02	13:22:43.8	056	79992	75000	6.66
87/10/02	13:30:16.5	057	92718	79740	16.28
87/10/02	13:31:12.1	065	77972	75200	3.69
87/10/02	13:40:10.0	061	37572	39280	-4.35
87/10/02	13:48:47.0	058	82214	71140	15.57
87/10/02	13:50:45.0	064	78780	75340	4.57
87/10/02	13:51:49.0	053	28280	37320	-24.22
87/10/02	13:56:26.9	067	50298	48360	4.01
87/10/02	14:02:37.0	060	37168	35900	3.53
87/10/02	14:09:16.8	062	98374	78660	25.06
87/10/02	14:16:35.3	062	71508	75360	-5.11
87/10/02	14:28:18.6	060	72316	65520	10.37
87/10/02	14:29:25.9	066	73124	77420	-5.55
87/10/02	14:33:21.0	067	75346	78060	-3.48
87/10/02	14:34:48.8	057	67872	72960	-6.97
87/10/02	14:46:18.0	063	28886	36200	-20.20
87/10/02	14:52:24.9	058	25048	28560	-12.30
87/10/02	14:55:55.6	058	33532	35780	-6.28
87/10/02	14:58:04.0	055	34138	36580	-6.68
87/10/02	15:17:41.0	055	49086	53640	-8.49
87/10/02	15:39:06.0	055	68882	69880	-1.43
87/10/02	15:40:09.1	065	77568	70800	9.56
87/10/02	15:46:18.8	061	44238	47740	-7.34
87/10/02	15:47:34.9	021	46056	51960	-11.36
87/10/02	15:53:49.5	052	74740	75360	-0.82
87/10/02	15:55:10.4	057	84638	71780	17.91
87/10/02	15:57:37.6	060	47066	47660	-1.25
87/10/02	15:58:14.0	052	34946	32540	7.39
87/10/02	15:59:50.9	060	31108	31440	-1.06
87/10/02	16:03:34.0	065	39592	32940	20.19
87/10/02	16:09:51.0	062	28886	30440	-5.11

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/02	16:17:49.0	059	90022	72640	23.93
87/10/02	16:24:46.5	057	29290	27960	4.76
87/10/02	16:29:37.0	064	34340	27180	26.34
87/10/02	16:33:26.8	056	34340	32680	5.08
87/10/02	16:34:07.2	077	24846	28900	-14.03
87/10/02	16:35:52.0	075	29492	29580	-0.30
87/10/02	16:37:20.9	063	67064	74540	-10.03
87/10/02	16:47:10.3	066	78486	74300	5.63
87/10/02	16:51:04.0	060	23432	28560	-17.96
87/10/02	16:51:26.8	072	64066	52220	22.68
87/10/02	16:51:57.6	066	34402	29900	15.06
87/10/02	16:53:07.3	057	29088	30040	-3.17
87/10/02	17:04:24.6	064	31310	35120	-10.85
87/10/02	17:12:17.4	062	91052	78560	15.90
87/10/02	17:18:01.5	055	84840	78980	7.42
87/10/02	17:27:15.0	059	68276	66040	3.39
87/10/02	17:29:18.7	060	33578	32820	2.31
87/10/02	17:29:30.6	066	80800	79480	1.66
87/10/02	17:30:44.7	049	81406	78740	3.39
87/10/02	17:32:30.0	064	93122	79160	17.64
87/10/02	17:33:01.6	066	68882	56280	22.39
87/10/02	17:38:15.7	078	85696	79700	7.52
87/10/02	17:44:43.4	061	72924	65820	10.79
87/10/02	17:49:56.3	052	80194	76200	5.24
87/10/02	17:50:33.0	064	61812	69200	-10.68
87/10/02	17:57:51.6	061	64236	76300	-15.81
87/10/02	18:08:01.7	055	88786	77300	14.86
87/10/02	18:11:39.0	068	63242	65200	-3.00
87/10/02	18:13:32.0	065	87962	77900	12.92
87/10/02	18:21:00.7	058	71482	75700	-5.57
87/10/02	18:21:10.0	057	48822	54900	-11.07
87/10/02	18:24:31.0	064	78174	73800	5.93
87/10/02	18:28:11.0	063	84840	77100	10.04
87/10/02	18:34:00.9	057	67670	66100	2.38
87/10/02	18:34:36.0	061	36966	42900	-13.83
87/10/02	18:35:09.0	065	57680	74700	-22.78
87/10/02	18:37:08.0	064	89610	77600	15.48
87/10/02	18:40:29.0	069	85078	79100	7.56
87/10/02	18:41:15.0	058	53934	67000	-19.50
87/10/02	18:41:41.0	053	75808	77200	-1.80
87/10/02	18:43:27.0	057	85696	77800	10.15
87/10/02	18:47:35.9	051	81370	77800	4.59
87/10/02	18:47:38.6	056	84436	77800	8.53
87/10/02	18:50:06.4	076	80752	78000	3.53
87/10/02	18:52:04.2	060	45248	48300	-6.32
87/10/02	18:54:40.8	062	77456	75200	3.00

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/02	18:56:58.0	056	61206	59800	2.35
87/10/02	18:57:07.9	058	36360	40900	-11.10
87/10/02	19:03:53.8	064	34744	30900	12.44
87/10/02	19:04:31.1	053	75190	76100	-1.20
87/10/02	19:06:54.0	053	33128	28100	17.89
87/10/02	19:07:36.5	066	72718	79300	-8.30
87/10/02	19:08:16.0	056	70902	73200	-3.14
87/10/02	19:08:26.7	058	76632	77400	-0.99
87/10/02	19:08:35.2	062	73542	77400	-4.98
87/10/02	19:13:11.0	049	78692	78900	-0.26
87/10/02	19:27:25.0	063	31108	28700	8.39
87/10/02	19:27:33.0	061	29694	29200	1.69
87/10/02	19:29:24.6	064	76356	79400	-3.83
87/10/02	19:29:13.0	057	83830	72500	15.63
87/10/02	19:52:25.0	062	73336	69200	5.98
87/10/02	20:12:34.0	053	70864	77000	-7.97
87/10/02	20:15:10.8	058	78780	66300	18.82
87/10/02	20:20:12.0	057	87550	75700	15.65
87/10/02	20:25:41.0	056	79310	78300	1.29
87/10/02	20:27:12.0	052	86860	80000	8.58
87/10/02	20:29:29.0	062	88072	80000	10.09
87/10/02	20:30:03.1	062	81782	79000	3.52
87/10/02	20:33:42.0	066	82812	78500	5.49
87/10/02	20:33:51.2	058	90640	78700	15.17
87/10/02	20:33:59.1	067	80340	79100	1.57
87/10/02	20:42:07.0	053	95172	72700	30.91
87/10/02	20:46:25.0	056	88992	75300	18.18
87/10/02	20:56:32.9	057	81608	79200	3.04
87/10/02	20:57:29.0	053	73528	70400	4.44
87/10/03	08:06:52.7	021	87264	68060	28.22
87/10/03	08:07:47.0	031	82012	65620	24.98
87/10/03	08:10:34.0	025	89688	76520	17.21
87/10/03	08:17:17.0	004	95950	79120	21.27
87/10/03	08:21:49.0	025	50500	30480	65.68
87/10/03	08:22:31.3	061	43878	44400	-1.18
87/10/03	08:22:52.6	064	51912	52520	-1.16
87/10/03	08:23:33.2	057	87344	80340	8.72
87/10/03	08:28:09.8	065	86726	76280	13.69
87/10/03	08:33:37.1	017	71508	71080	0.60
87/10/03	08:36:55.0	075	33372	30000	11.24
87/10/03	08:39:55.5	062	65714	60600	8.44
87/10/03	08:41:46.0	055	36874	35260	4.58
87/10/03	08:45:35.9	060	79104	77920	1.52
87/10/03	08:50:52.0	058	85696	75400	13.66
87/10/03	09:51:50.5	066	80340	78060	2.92
87/10/03	08:51:56.9	056	88168	80100	10.07

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CLASS 9 TRUCKS WITH STATIC WEIGHTS
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/03	08:52:36.0	022	41006	48440	-15.35
87/10/03	08:54:16.0	052	104648	85900	21.83
87/10/03	08:56:31.9	006	74538	55780	33.63
87/10/03	09:32:28.8	055	88168	72360	21.85
87/10/03	09:37:28.0	060	65246	69780	-6.50
87/10/03	09:43:34.3	033	87870	69740	26.00
87/10/03	09:49:15.8	063	80396	75940	5.87
87/10/03	09:53:10.1	058	90640	77680	16.68
87/10/03	09:56:31.1	066	55414	53300	3.97
87/10/03	09:56:42.6	065	59122	55180	7.14
87/10/03	10:04:34.0	057	54742	58320	-6.14
87/10/03	10:05:09.5	064	86658	75340	15.02
87/10/03	10:08:05.6	066	56964	55000	3.57
87/10/03	10:16:20.0	064	66538	53860	23.54
87/10/03	10:22:55.0	066	59994	53140	12.90
87/10/03	10:23:47.1	058	58782	55100	6.68
87/10/03	10:24:49.0	072	70296	57120	23.07
87/10/03	10:25:47.0	064	82606	78740	4.91
87/10/03	10:29:25.6	057	73748	77660	-5.04
87/10/03	10:37:37.9	059	54944	47520	15.62
87/10/03	10:38:04.9	060	65302	79160	-17.51
87/10/03	10:42:20.3	060	80546	77220	4.31
87/10/03	10:51:43.5	062	53530	43300	23.63
87/10/03	10:53:50.0	054	87138	80040	8.87
87/10/03	10:55:05.9	069	57368	40000	43.42
87/10/03	10:56:17.0	063	78578	75800	3.66
87/10/03	10:57:32.0	063	78486	78960	-0.60
87/10/03	10:58:44.2	059	83224	76080	9.39
87/10/03	11:01:17.2	064	76558	73100	4.73
87/10/03	11:02:49.0	061	78982	79080	-0.12
87/10/03	11:03:07.0	052	53560	56460	-5.14
87/10/03	11:03:51.7	059	63226	78660	-19.62
87/10/03	11:08:02.7	057	63036	78860	-20.07
87/10/03	11:10:23.0	066	82400	77360	6.51
87/10/03	11:12:39.0	065	85284	78860	8.15
87/10/03	11:12:43.4	063	85284	76840	10.99
87/10/03	11:13:50.1	063	88168	76840	14.74
87/10/03	11:17:44.0	069	29290	29340	-0.17
87/10/03	11:20:30.0	069	46056	53702	-14.24
87/10/03	11:20:56.1	063	36462	33418	9.11
87/10/03	11:21:45.8	060	71306	78460	-9.12
87/10/03	11:22:17.0	075	26058	29680	-12.20
87/10/03	11:23:18.9	063	80546	70920	13.57
87/10/03	11:24:48.4	062	27472	29120	-5.66
87/10/03	11:24:58.0	067	83224	79320	4.92
87/10/03	11:25:15.1	057	35956	34580	3.98

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/03	11:26:21.0	055	55550	41800	32.89
87/10/03	11:26:36.2	071	32522	29220	11.30
87/10/03	11:30:33.7	060	60398	64760	-6.74
87/10/03	11:34:32.8	057	64272	74660	-13.91
87/10/03	11:35:36.0	064	65302	78180	-16.47
87/10/03	11:37:42.7	063	33128	27440	20.73
87/10/03	11:38:54.9	065	61388	78920	-22.21
87/10/03	11:39:07.0	073	73528	75160	-2.17
87/10/03	11:39:25.5	066	82400	75580	9.02
87/10/03	11:40:12.0	056	73326	73760	-0.59
87/10/03	11:41:35.9	065	51294	64810	-20.85
87/10/03	11:42:46.0	062	85490	80020	6.84
87/10/03	11:43:34.2	067	35754	35820	-0.18
87/10/03	11:51:41.0	066	83224	77460	7.44
87/10/03	11:52:54.5	060	23278	33520	-30.55
87/10/03	11:53:52.3	055	37976	37580	1.05
87/10/03	11:54:56.0	029	89082	76680	16.17
87/10/03	12:01:17.8	058	54944	55400	-0.82
87/10/03	12:07:05.0	057	55826	68400	-18.38
87/10/03	12:13:10.1	064	51912	52540	-1.20
87/10/03	12:15:35.0	063	38316	32100	19.36
87/10/03	12:15:46.0	057	82194	76860	6.94
87/10/03	12:15:57.0	056	70246	75480	-6.93
87/10/03	12:17:24.1	060	70864	78800	-10.07
87/10/03	12:20:56.0	067	29088	39160	-25.72
87/10/03	12:23:34.0	062	37572	32980	13.92
87/10/03	12:24:05.0	068	40400	56700	-28.75
87/10/03	12:26:21.4	062	29492	31980	-7.78
87/10/03	12:26:34.8	066	29896	30100	-0.68
87/10/03	12:27:57.0	063	84840	78380	8.24
87/10/03	12:28:58.0	051	30906	36540	-15.42
87/10/03	12:30:36.1	066	54136	77920	-30.52
87/10/03	12:31:47.1	061	69892	59800	16.88
87/10/03	12:34:23.2	056	32118	30960	3.74
87/10/03	12:35:22.0	047	27674	31180	-11.24
87/10/03	12:36:57.0	059	53126	78000	-31.89
87/10/03	12:38:54.2	065	71070	76000	-6.49
87/10/03	12:46:41.1	066	80546	76180	5.73
87/10/03	12:48:41.6	067	26664	31180	-14.48
87/10/03	12:52:01.2	066	80340	79040	1.64
87/10/03	12:55:21.0	062	22866	29880	-23.47
87/10/03	12:56:26.3	070	68186	75360	-9.52
87/10/03	12:56:28.7	066	64034	77560	-17.44
87/10/03	12:56:41.0	062	80800	77960	3.64
87/10/03	12:57:01.4	069	72100	78120	-7.71
87/10/03	13:03:09.2	076	79790	75520	5.65

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/03	13:09:40.6	064	61610	64480	-4.45
87/10/03	13:15:48.0	053	29290	30800	-4.90
87/10/03	13:16:01.0	057	34138	67420	-49.37
87/10/03	13:17:21.9	059	76558	73640	3.96
87/10/03	13:19:41.0	065	33936	42580	-20.30
87/10/03	13:21:50.4	062	104434	60440	72.79
87/10/03	13:24:06.0	067	73336	76240	-3.81
87/10/03	13:25:03.4	054	70700	78680	-10.14
87/10/03	13:25:41.0	070	27876	30560	-8.78
87/10/03	13:30:32.7	059	64272	48920	31.38
87/10/03	13:31:01.0	059	78074	79500	-1.79
87/10/03	13:35:23.6	055	28482	35580	-19.95
87/10/03	13:36:04.7	065	89486	78500	13.99
87/10/03	13:40:01.0	059	32724	35120	-6.82
87/10/03	13:41:38.0	062	45652	45700	-0.11
87/10/03	13:46:38.5	057	78174	71800	8.88
87/10/03	13:48:15.2	059	51106	52520	-2.69
87/10/03	13:49:10.0	060	72718	80100	-9.22
87/10/03	13:53:58.7	057	79310	79760	-0.56
87/10/03	13:54:04.6	056	68186	75700	-9.93
87/10/03	13:55:46.0	066	68804	79460	-13.41
87/10/03	13:58:47.8	060	59186	62820	-5.78
87/10/03	14:05:08.0	062	33578	38280	-12.28
87/10/03	14:05:36.3	058	79386	75700	4.87
87/10/03	14:06:29.0	056	72720	71120	2.25
87/10/03	14:06:53.8	064	43878	42960	2.14
87/10/03	14:09:10.0	062	27674	29560	-6.38
87/10/03	14:09:31.0	073	20200	22880	-11.71
87/10/03	14:18:48.6	073	42024	57980	-27.52
87/10/03	14:18:56.6	047	78074	78920	-1.07
87/10/03	14:20:11.0	049	90900	74500	22.01
87/10/03	14:20:16.0	052	69690	65260	6.79
87/10/03	14:20:22.8	060	69010	57480	20.06
87/10/03	14:22:09.0	066	30900	54140	-42.93
87/10/03	14:22:23.2	065	74984	75180	-0.26
87/10/03	14:22:37.0	065	69892	68640	1.82
87/10/03	14:23:56.1	056	69422	78820	-11.92
87/10/03	14:29:46.6	047	71912	53220	35.12
87/10/03	14:29:50.4	052	83022	77540	7.07
87/10/03	14:30:22.3	062	69628	78760	-11.59
87/10/03	14:30:33.1	056	53530	49240	8.71
87/10/03	14:31:07.0	070	51510	40280	27.88
87/10/03	14:34:03.7	058	67774	73460	-7.74
87/10/03	14:35:34.5	065	77164	73640	4.79
87/10/03	14:35:39.3	062	83426	79748	4.61
87/10/03	14:38:19.4	061	52116	72600	-28.21

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/03	14:39:23.0	054	48682	45300	7.47
87/10/03	14:40:05.0	066	70902	59720	18.72
87/10/03	14:40:23.0	061	70658	77360	-8.66
87/10/03	14:44:15.8	064	49692	52340	-5.06
87/10/03	14:46:35.0	060	45732	48400	-5.51
87/10/03	14:49:18.6	062	78376	79100	-0.92
87/10/03	14:50:16.0	060	31518	34200	-7.84
87/10/03	14:52:24.2	058	79588	66500	19.68
87/10/03	14:54:01.0	054	79104	77540	2.02
87/10/03	14:54:12.5	058	70864	78700	-9.96
87/10/03	15:06:46.8	056	32754	44360	-26.16
87/10/03	15:08:36.0	075	84032	78520	7.02
87/10/03	15:08:41.5	056	41410	34400	20.38
87/10/03	15:13:50.8	055	87344	74700	16.93
87/10/03	15:16:50.8	058	62014	58780	5.50
87/10/03	15:17:17.0	075	40376	48000	-15.88
87/10/03	15:19:39.7	059	80598	75640	6.55
87/10/03	15:20:21.8	065	76426	73920	3.39
87/10/03	15:22:03.3	062	76426	76920	-0.64
87/10/03	15:24:35.0	058	54590	61480	-11.21
87/10/03	15:26:32.6	069	32926	31380	4.93
87/10/03	15:29:56.9	060	78578	78320	0.33
87/10/03	15:33:25.9	058	52324	79620	-34.28
87/10/03	15:34:36.7	057	78376	60000	30.63
87/10/03	15:35:17.0	065	56650	55520	2.04
87/10/03	15:40:48.1	062	25654	27140	-5.48
87/10/03	15:41:18.0	068	84460	78840	7.13
87/10/03	15:41:39.1	068	68804	70420	-2.29
87/10/03	15:44:29.0	062	71276	76100	-6.34
87/10/03	15:45:28.2	058	76426	78200	-2.27
87/10/03	15:48:36.8	075	29290	29420	-0.44
87/10/03	15:50:03.5	058	75144	76940	-2.33
87/10/03	15:50:14.9	065	72306	78520	-7.91
87/10/03	15:52:56.0	058	68882	64780	6.33
87/10/20	10:51:51.4	067	42354	34020	24.50
87/10/20	11:44:56.2	050	65286	72460	-9.90
87/10/20	12:11:48.6	055	76752	79680	-3.67
87/10/20	12:41:10.0	063	35568	44700	-20.43
87/10/20	12:43:34.6	033	81666	79920	2.18
87/10/20	13:19:33.7	066	73944	54860	34.79
87/10/20	13:22:47.0	065	102492	80660	27.07
87/10/20	13:24:42.9	073	73242	58960	24.22
87/10/20	13:40:28.0	080	38610	31880	21.11
87/10/20	13:50:16.0	060	91260	79620	14.62
87/10/20	14:20:28.7	052	71838	66120	8.65
87/10/20	14:31:54.1	076	95706	75960	26.00

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
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DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/20	15:25:33.1	056	85410	75980	12.41
87/10/20	15:50:01.5	066	70200	79580	-11.79
87/10/20	15:53:00.9	053	59202	54960	7.72
87/10/20	15:56:23.7	067	89388	70960	25.97
87/10/20	15:58:38.4	065	81666	71540	14.15
87/10/20	15:58:45.1	067	79326	70880	11.92
87/10/20	15:59:13.3	065	75396	79580	-5.26
87/10/20	16:34:53.7	065	96876	74620	29.83
87/10/20	16:35:32.6	073	39546	49900	-20.75
87/10/20	16:39:01.0	062	102726	76840	33.69
87/10/20	16:40:36.0	073	37206	37920	-1.88
87/10/20	16:44:14.0	067	65520	48300	35.65
87/10/20	16:49:19.6	061	88218	83920	5.12
87/10/20	16:51:57.0	062	68796	72860	-5.58
87/10/20	16:52:41.8	070	86580	75580	14.55
87/10/20	16:55:58.0	064	80262	77980	2.93
87/10/20	16:57:35.3	063	59904	55060	8.80
87/10/20	17:23:31.0	066	91670	78620	16.60
87/10/20	18:23:28.2	060	102794	77880	31.99
87/10/20	18:26:54.0	035	85284	77840	9.56
87/10/21	07:50:58.7	070	92700	76780	20.73
87/10/21	09:11:10.0	063	95790	71240	34.46
87/10/21	09:14:58.0	065	84666	80020	5.81
87/10/21	10:06:18.0	058	82368	78620	4.77
87/10/21	10:22:30.0	072	113724	76660	48.35
87/10/21	10:35:29.0	070	51012	47140	8.21
87/10/21	10:51:32.9	074	96408	78600	22.66
87/10/21	11:30:14.4	065	91494	78780	16.14
87/10/21	11:42:38.3	071	44928	45260	-0.73
87/10/21	11:43:24.2	075	95472	77700	22.87
87/10/21	11:43:31.0	080	96642	78740	22.74
87/10/21	11:44:13.0	063	122148	77340	57.94
87/10/21	11:56:01.7	089	83070	64640	28.51
87/10/21	11:59:55.0	065	45396	36300	25.06
87/10/21	12:00:46.8	064	70200	56960	23.24
87/10/21	12:20:12.0	064	98046	76460	28.23
87/10/21	12:25:53.6	056	128466	74700	71.98
87/10/21	12:31:29.0	065	36972	30360	21.78
87/10/21	12:45:17.0	063	96876	72200	34.18
87/10/21	12:48:00.4	062	85878	79700	7.75
87/10/21	12:52:18.0	062	84708	79060	7.14
87/10/21	12:52:56.0	071	91962	80380	14.41
87/10/21	12:56:02.1	058	96408	75420	27.83
87/10/21	12:59:09.6	062	92494	76380	21.10
87/10/21	12:59:13.6	066	86932	73260	18.66
87/10/21	13:37:16.0	058	81666	73940	10.45

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/21	13:37:33.5	069	76518	76060	0.60
87/10/21	14:01:29.0	073	86112	73400	17.32
87/10/21	14:09:23.3	064	83430	73200	13.98
87/10/21	14:21:39.2	057	86112	80860	6.50
87/10/21	14:21:44.3	053	77688	77600	0.11
87/10/21	14:36:04.0	069	88452	77880	13.57
87/10/21	14:37:18.0	071	34398	29740	15.66
87/10/21	14:46:03.0	064	56862	56460	0.71
87/10/21	14:53:23.0	052	86932	79220	9.73
87/10/21	15:23:03.2	065	87048	77560	12.23
87/10/21	15:34:49.0	068	38934	37020	5.17
87/10/21	15:34:59.0	069	87984	79720	10.37
87/10/21	15:45:18.0	058	123318	80240	53.69
87/10/21	15:48:31.4	071	43466	64400	-32.51
87/10/21	16:03:50.2	068	33930	30560	11.03
87/10/21	16:14:51.0	053	77922	69300	12.44
87/10/21	16:19:29.8	063	69498	54740	26.96
87/10/21	16:20:35.0	062	97578	76740	27.15
87/10/21	16:35:23.0	069	50470	47200	6.93
87/10/21	16:36:23.0	050	86108	62240	38.35
87/10/21	16:41:39.0	071	107172	76420	40.24
87/10/21	16:49:00.3	061	87138	78700	10.72
87/10/21	16:53:05.7	062	103896	73180	41.97
87/10/21	16:58:36.3	037	82836	76200	8.71
87/10/22	10:17:56.0	061	70668	57240	23.46
87/10/22	10:35:33.6	052	90434	80340	12.56
87/10/22	11:01:46.0	074	25506	27000	-5.53
87/10/22	11:29:24.0	073	88452	63820	38.60
87/10/22	11:29:43.6	071	73242	53020	38.14
87/10/22	11:37:24.0	061	89622	73940	21.21
87/10/22	11:50:59.0	055	97812	77660	25.95
87/10/22	11:56:27.7	066	58968	46280	27.42
87/10/22	11:56:39.2	065	89622	71060	26.12
87/10/22	12:11:32.9	076	51948	49040	5.93
87/10/22	12:21:52.8	064	107172	80120	33.76
87/10/22	12:21:57.5	062	95238	76700	24.17
87/10/22	12:24:13.0	060	68328	73740	-7.34
87/10/22	12:28:29.0	063	85410	71220	19.92
87/10/22	12:37:36.0	078	33930	30180	12.43
87/10/22	12:48:56.6	062	84240	79840	5.51
87/10/22	12:49:21.0	069	84942	79680	6.60
87/10/22	12:52:18.0	068	86814	78880	10.06
87/10/22	13:03:01.0	052	81666	72380	12.83
87/10/22	13:08:42.0	062	98982	79020	25.26
87/10/22	13:12:10.4	073	32760	34260	-4.38
87/10/22	13:31:54.0	072	38376	31600	21.44

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/22	13:37:27.0	063	84708	75360	12.40
87/10/22	13:48:28.6	053	45396	37280	21.77
87/10/22	13:50:47.0	074	68796	57660	19.31
87/10/22	14:07:59.4	078	46098	34780	32.54
87/10/22	14:13:58.0	065	31590	33120	-4.62
87/10/22	14:18:32.0	060	75114	71780	4.64
87/10/22	14:29:08.5	066	85878	78400	9.54
87/10/22	14:30:14.0	063	56862	66420	-14.39
87/10/22	14:31:24.0	069	91026	79560	14.41
87/10/22	14:35:40.7	062	105534	76680	37.63
87/10/22	14:46:38.4	076	29250	34700	-15.71
87/10/22	15:01:59.0	065	94068	77200	21.85
87/10/22	15:15:27.2	061	102960	78940	30.43
87/10/22	15:25:07.0	071	29952	33980	-11.85
87/10/22	15:28:23.2	069	108342	78380	38.23
87/10/22	16:35:04.9	062	65286	49240	32.59
87/10/22	16:36:36.0	058	29718	32300	-7.99
87/10/26	17:06:32.0	063	89870	80100	12.20
87/10/26	17:35:05.4	020	92665	79860	16.03
87/10/26	18:27:07.2	064	82775	79860	3.65
87/10/26	18:40:01.4	053	89655	68200	31.46
87/10/26	18:42:44.8	052	87935	78700	11.73
87/10/26	18:44:51.2	062	30530	26940	13.33
87/10/26	18:45:05.0	056	87505	76860	13.85
87/10/26	19:07:02.0	057	103200	88080	17.17
87/10/27	05:59:24.6	055	94170	78980	19.23
87/10/27	06:32:06.6	052	112875	80240	40.67
87/10/27	06:46:01.1	053	81700	58100	40.62
87/10/27	07:14:34.0	050	108360	89340	21.29
87/10/27	07:14:48.8	050	83635	65300	28.08
87/10/27	08:12:04.8	044	93310	76840	21.43
87/10/27	08:13:59.0	050	44440	52280	-15.00
87/10/27	08:14:05.2	059	80194	78800	1.77
87/10/27	08:21:30.9	051	73745	66840	10.33
87/10/27	08:51:02.8	057	89655	76940	16.53
87/10/27	12:39:14.8	064	61812	70640	-12.50
87/10/27	12:57:47.3	057	78045	79380	-1.68
87/10/27	13:05:20.4	061	46655	46320	0.72
87/10/27	13:11:55.4	057	86456	92360	-6.39
87/10/27	13:17:19.0	075	75035	79560	-5.69
87/10/27	13:18:10.0	062	97395	79240	22.91
87/10/27	13:21:27.1	053	70498	76140	-7.41
87/10/27	13:31:30.7	061	88795	80720	10.00
87/10/27	13:45:45.5	056	67510	78440	-13.93
87/10/27	13:49:17.0	071	39188	55580	-29.49
87/10/27	13:55:33.3	057	79980	76480	4.58

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/27	14:15:09.0	059	33540	44600	-24.80
87/10/27	14:15:24.2	053	77185	79420	-2.81
87/10/27	14:32:57.0	063	86000	79120	8.70
87/10/27	14:33:44.8	059	76970	79920	-3.69
87/10/27	14:34:15.0	058	86215	80020	7.74
87/10/27	15:00:30.7	061	82990	77220	7.47
87/10/27	15:08:09.0	065	91160	79520	14.64
87/10/27	15:22:19.7	058	78475	79100	-0.79
87/10/27	15:46:26.4	022	89225	79460	12.29
87/10/27	15:48:53.7	065	52460	50060	4.79
87/10/27	15:49:26.0	057	80410	78980	1.81
87/10/28	09:44:32.9	058	76154	76680	-0.69
87/10/28	09:44:58.8	056	31714	36540	-13.21
87/10/28	09:46:08.0	053	99545	79060	25.91
87/10/28	09:46:27.6	059	100835	79580	26.71
87/10/28	09:49:52.9	046	31714	30920	2.57
87/10/28	09:57:11.0	063	82345	76420	7.75
87/10/28	09:58:00.5	055	96320	79820	20.67
87/10/28	10:07:00.5	057	30100	30920	-2.65
87/10/28	10:28:33.2	063	84925	79900	6.29
87/10/28	10:45:31.5	065	96750	81280	19.03
87/10/28	10:51:02.9	058	72670	59800	21.52
87/10/28	10:51:11.8	057	26875	33300	-19.29
87/10/28	10:52:09.0	054	77366	67400	14.79
87/10/28	11:05:55.6	022	94385	79740	18.37
87/10/28	11:22:50.0	055	84495	79120	6.79
87/10/28	11:38:01.3	051	72518	77820	-6.81
87/10/28	11:39:29.0	065	96965	79100	22.59
87/10/28	12:07:20.8	060	59555	61660	-3.41
87/10/28	12:25:58.0	057	76755	80220	-4.32
87/10/28	12:26:18.2	063	78905	79300	-0.50
87/10/28	12:30:43.7	055	75680	72680	4.13
87/10/28	12:31:15.0	060	75465	79460	-5.03
87/10/28	12:32:47.6	069	87720	79500	10.34
87/10/28	12:38:54.0	062	40635	33720	20.51
87/10/28	12:55:24.9	060	52318	78500	-33.35
87/10/28	12:58:07.7	056	64842	71200	-8.93
87/10/28	13:03:25.2	060	71810	77900	-7.82
87/10/28	13:03:29.4	062	73960	74860	-1.20
87/10/28	13:05:40.6	053	72025	79860	-9.81
87/10/28	13:18:06.5	058	75465	77360	-2.45
87/10/28	13:19:56.0	057	76325	70940	7.59
87/10/28	13:44:38.0	051	66862	76860	-13.01
87/10/28	13:49:27.0	058	80195	76440	4.91
87/10/28	13:51:09.6	047	58176	65500	-11.18
87/10/28	13:53:45.4	059	66435	74820	-11.21

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/28	13:54:23.0	052	68074	78740	-13.55
87/10/28	14:03:16.8	058	84925	78860	7.69
87/10/28	14:06:02.6	045	38178	64060	-40.40
87/10/28	14:07:59.0	060	85570	72880	17.41
87/10/28	14:16:38.0	047	80598	77020	4.65
87/10/28	14:17:03.0	057	76540	78540	-2.55
87/10/28	14:17:07.5	054	77400	79640	-2.81
87/10/28	14:22:18.0	053	76154	79420	-4.11
87/10/28	14:31:34.4	067	79980	78240	2.22
87/10/28	14:39:28.1	035	81055	78880	2.76
87/10/28	14:39:29.8	053	39592	51640	-23.33
87/10/28	14:41:09.0	061	73745	66060	11.63
87/10/28	14:41:23.0	060	67940	68160	-0.32
87/10/28	14:47:35.0	062	75465	72420	4.20
87/10/28	14:58:43.2	062	77185	76920	0.34
87/10/28	15:02:18.8	069	73960	76540	-3.37
87/10/28	15:03:56.2	056	70094	79340	-11.65
87/10/28	15:09:38.0	060	89655	78060	14.85
87/10/28	15:13:13.0	061	79335	79360	-0.03
87/10/28	15:33:30.2	065	81055	79160	2.39
87/10/28	15:50:19.9	056	77400	67360	14.90
87/10/28	15:52:34.0	057	79335	79740	-0.51
87/10/28	15:52:47.1	057	75895	78700	-3.56
87/10/28	16:04:07.2	058	33936	44000	-22.87
87/10/28	16:05:52.0	061	83420	78680	6.02
87/10/28	16:15:42.8	066	79120	67240	17.67
87/10/28	16:24:18.2	060	82345	79880	3.09
87/10/28	16:34:01.0	053	74390	80420	-7.50
87/10/28	16:44:12.8	053	27520	35780	-23.09
87/10/28	16:47:01.3	048	80194	78500	2.16
87/10/28	16:48:26.0	062	41495	38280	8.40
87/10/28	16:53:59.2	047	47874	68260	-29.87
87/10/29	07:57:20.0	060	55040	61700	-10.79
87/10/29	07:57:50.0	067	68155	72760	-6.33
87/10/29	08:03:35.9	056	64715	55720	16.14
87/10/29	08:04:56.9	063	84925	68700	23.62
87/10/29	08:13:55.0	066	82345	72100	14.21
87/10/29	08:14:30.4	058	93955	79440	18.27
87/10/29	08:28:12.9	062	73100	60400	21.03
87/10/29	08:32:50.1	064	105350	78260	34.62
87/10/29	08:33:31.6	064	38270	35980	6.36
87/10/29	08:36:35.1	062	89870	79560	12.96
87/10/29	08:39:45.4	056	70700	71000	-0.42
87/10/29	08:49:51.2	058	79120	79280	-0.20
87/10/29	08:58:56.0	052	86000	77620	10.80
87/10/29	09:10:19.9	055	92235	79280	16.34

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/10/29	09:11:40.0	045	91805	79760	15.10
87/10/29	09:21:29.8	022	86645	79300	9.26
87/10/29	09:25:54.0	061	53965	79860	-32.43
87/10/29	09:37:03.8	056	69875	78860	-11.39
87/10/29	09:57:25.0	053	79550	77200	3.04
87/10/29	10:07:10.9	062	108575	80140	35.45
87/10/29	10:07:19.0	065	95675	80460	18.91
87/10/29	10:23:07.3	057	68800	63300	8.69
87/10/29	10:31:53.0	037	93728	79720	17.57
87/10/29	10:38:30.6	053	69892	70780	-1.25
87/10/29	10:42:59.8	060	62135	53080	17.06
87/10/29	10:43:42.1	047	70700	77660	-8.96
87/10/29	10:54:03.0	053	76325	74040	3.09
87/10/29	10:54:14.0	065	83850	80900	3.65
87/10/29	11:06:29.9	055	79335	77100	2.90
87/10/29	11:06:53.0	062	79980	78940	1.32
87/10/29	11:09:36.0	055	68074	79640	-14.52
87/10/29	11:14:52.3	063	72885	72120	1.06
87/10/29	11:15:04.0	065	87505	79500	10.07
87/10/29	11:17:59.8	056	45365	63940	-29.05
87/10/29	11:21:32.3	061	82560	80360	2.74
87/10/29	11:37:50.0	053	30300	37760	-19.76
87/10/29	11:38:07.8	053	75680	77820	-2.75
87/10/29	11:52:25.0	059	82345	79280	3.87
87/10/29	12:02:37.0	053	73523	76160	-3.46
87/10/29	12:03:35.0	065	78475	82600	-4.99
87/10/29	12:06:33.3	060	59770	58560	2.07
87/10/29	12:14:01.0	060	77830	66220	17.53
87/10/29	12:16:32.9	060	84065	79240	6.09
87/10/29	12:21:17.0	064	77830	75100	3.64
87/10/29	12:29:49.0	062	78475	75180	4.38
87/10/29	12:39:24.1	058	84495	79640	6.10
87/11/01	10:06:21.7	062	70246	60960	15.23
87/11/01	11:26:25.6	062	66332	55360	19.82
87/11/01	11:27:17.0	065	79722	79080	0.81
87/11/01	11:38:40.0	058	57268	59200	-3.26
87/11/01	11:51:04.1	066	93318	78300	19.18
87/11/01	12:23:50.0	068	73748	70660	4.37
87/11/01	12:35:16.0	069	55954	50720	10.32
87/11/01	12:40:31.6	060	78898	72860	8.29
87/11/01	12:40:36.8	057	52736	54400	-3.06
87/11/01	13:52:56.0	059	101558	79300	28.07
87/11/01	13:53:46.0	064	84460	80660	4.71
87/11/01	15:00:49.0	065	81988	62780	30.60
87/11/01	15:15:26.6	062	58710	52300	12.26
87/11/01	15:29:53.0	059	69628	66520	4.67

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
87/11/01	16:01:41.4	061	73954	79220	-6.65
87/11/01	16:12:48.0	071	79722	73880	7.91
88/04/28	15:26:00.2	059	29607	39100	-24.28
88/04/28	15:26:47.7	061	62800	62900	-0.16
88/04/28	15:45:11.6	071	29240	30900	-5.37
88/04/28	16:12:46.0	065	72800	69000	5.51
88/04/28	16:38:06.0	072	64715	72500	-10.74
88/04/28	17:08:56.2	055	27903	31500	-11.42
88/04/28	17:11:28.9	065	45400	50000	-9.20
88/04/28	17:14:22.0	062	80940	76400	5.81
88/04/28	17:51:43.0	059	55470	41900	32.39
88/04/28	17:54:27.9	064	86691	74900	15.74
88/04/28	19:18:35.0	065	94815	69900	35.64
88/04/28	19:41:12.0	047	77106	77500	-0.51
88/04/28	20:28:42.0	056	25800	37400	-31.02
88/04/29	08:20:16.0	062	27800	28000	-0.71
88/04/29	08:43:29.0	058	54200	57100	-5.08
88/04/29	09:23:28.0	021	44600	42500	4.94
88/04/29	09:34:21.0	057	74800	77500	-3.48
88/04/29	09:53:32.2	066	94815	79900	18.67
88/04/29	10:12:53.0	060	35905	31800	12.91
88/04/29	11:14:02.2	060	47800	48300	-1.04
88/04/29	11:18:58.8	063	75895	79300	-4.29
88/04/29	12:06:03.0	070	76540	76600	-0.08
88/04/29	12:21:45.0	079	24510	51500	-52.41
88/04/29	12:40:40.4	052	27264	30900	-11.77
88/04/29	12:55:41.9	058	80940	77600	4.30
88/04/29	16:01:52.0	061	79023	77900	1.44
88/04/29	16:13:26.1	056	25986	28700	-9.46
88/04/29	16:16:41.2	062	58910	51400	14.61
88/04/29	16:23:35.6	061	83283	78300	6.36
88/04/30	07:44:59.8	064	49800	48900	1.84
88/04/30	08:17:02.0	070	97554	84400	15.59
88/04/30	08:44:39.0	056	77800	70400	10.51
88/04/30	08:53:34.0	071	85413	77700	9.93
88/04/30	09:26:05.0	058	61344	54300	12.97
88/04/30	09:31:41.8	063	77532	73200	5.92
88/04/30	09:40:18.2	066	70290	69900	0.56
88/04/30	10:27:51.1	056	84348	78800	7.04
88/05/11	08:16:44.5	056	67266	73460	-8.43
88/05/11	09:22:32.0	057	94385	78400	20.39
88/05/11	10:01:57.0	056	31605	33020	-4.29
88/05/11	11:25:25.0	045	54742	66660	-17.88
88/05/11	12:03:51.7	048	85042	80100	6.17
88/05/11	12:07:26.0	057	82005	68880	19.05
88/05/11	13:34:57.0	055	61206	74420	-17.76

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
88/05/11	13:35:08.8	053	67468	76880	-12.24
88/05/11	15:02:45.3	043	55900	33020	69.29
88/05/11	15:20:44.8	051	74740	80280	-6.90
88/05/12	09:07:22.5	048	66220	58380	13.43
88/05/12	10:41:00.1	047	73960	79720	-7.23
88/05/12	10:46:11.2	042	36120	37320	-3.22
88/05/12	12:03:46.0	047	45150	51660	-12.60
88/05/12	12:45:03.7	042	71595	79660	-10.12
88/05/12	12:50:06.2	046	54395	79080	-31.22
88/05/12	13:05:18.0	030	21513	30200	-28.76
88/05/12	13:18:50.7	052	66865	74500	-10.25
88/05/12	14:36:41.7	039	71595	79220	-9.63
88/05/12	15:01:08.6	045	66650	78920	-15.55
88/05/12	15:13:05.5	043	43878	57760	-24.03
88/05/12	15:26:20.9	054	45795	53600	-14.56
88/05/13	08:34:57.0	042	62135	79140	-21.49
88/05/26	14:16:48.0	042	50955	78000	-34.67
88/06/28	15:04:29.9	063	29025	43200	-32.81
88/06/28	15:14:41.2	058	39345	41780	-5.83
88/06/28	17:10:17.9	047	103731	76760	35.14
88/06/28	17:13:50.0	040	87756	70340	24.76
88/06/28	17:23:20.7	039	87117	79520	9.55
88/06/28	17:36:01.0	035	95850	77880	23.07
88/06/28	17:48:06.6	032	89460	75000	19.28
88/06/28	18:10:25.6	037	67521	54600	23.66
88/06/28	18:49:12.0	048	58362	48000	21.59
88/06/28	19:33:14.0	042	40470	37080	9.14
88/06/28	20:21:42.2	030	82431	79200	4.08
88/06/29	14:47:26.0	067	69628	76160	-8.58
88/06/29	15:33:37.0	069	86314	79420	8.68
88/06/29	15:33:49.0	078	90846	79900	13.70
88/06/29	15:45:40.3	062	90228	76340	18.19
88/06/29	16:03:37.0	029	99471	74340	33.81
88/06/29	16:23:44.0	043	44730	35460	26.14
88/06/29	16:42:13.0	074	21012	34500	-39.10
88/06/29	16:43:50.1	065	35226	35480	-0.72
88/06/29	17:09:51.6	060	29252	32180	-9.10
88/06/29	17:22:53.0	056	90434	71420	26.62
88/06/29	17:31:14.0	043	62622	52480	19.33
88/06/29	17:48:51.0	043	83496	69220	20.62
88/06/29	17:56:30.1	056	79722	79180	0.68
88/06/29	18:00:17.2	055	29046	33400	-13.04
88/06/29	18:16:13.0	042	102453	78900	29.85
88/06/29	19:05:54.0	058	24725	41700	-40.71
88/06/29	20:50:08.4	062	31930	39320	-18.79
88/06/29	21:21:30.2	064	31724	41700	-23.92

APPENDIX 1
CLASS 9 TRUCKS WITH STATIC WEIGHTS
AVAILABLE FOR COMPARISON
NUMBER IN SET = 1631

DATE	TIME	SPEED	WIM WEIGHT	STATIC WEIGHT	PERCENTAGE DIFFERENCE
88/06/30	14:10:51.5	064	60845	74760	-18.61
88/06/30	14:14:46.9	062	63210	68360	-7.53
88/06/30	15:12:52.4	060	29455	41060	-28.26
88/06/30	15:13:03.0	064	40205	65260	-38.39
88/06/30	15:24:10.6	043	66456	55540	19.65
88/06/30	15:32:29.8	032	88821	80300	10.61
88/06/30	15:48:25.5	042	50055	47340	5.74
88/06/30	16:33:18.3	062	86314	72480	19.09
88/06/30	16:39:58.8	031	87756	79560	10.30
88/06/30	17:02:35.0	081	37904	36700	3.28
88/06/30	17:43:00.4	060	87756	79620	10.22
88/06/30	17:43:43.7	057	91052	79000	15.26
88/06/30	19:17:17.9	023	82005	77380	5.98
88/06/30	19:31:25.0	039	78171	74440	5.01
88/06/30	20:04:24.4	074	89404	79140	12.97
88/06/30	20:15:51.0	035	50055	39420	26.98
88/06/30	20:26:52.7	032	41748	43760	-4.60
88/06/30	20:45:25.9	066	34608	33720	2.63
88/06/30	21:08:50.0	058	59946	51040	17.45
88/06/30	21:14:51.0	058	71070	78160	-9.07
88/06/30	21:15:10.0	062	81164	77920	4.16